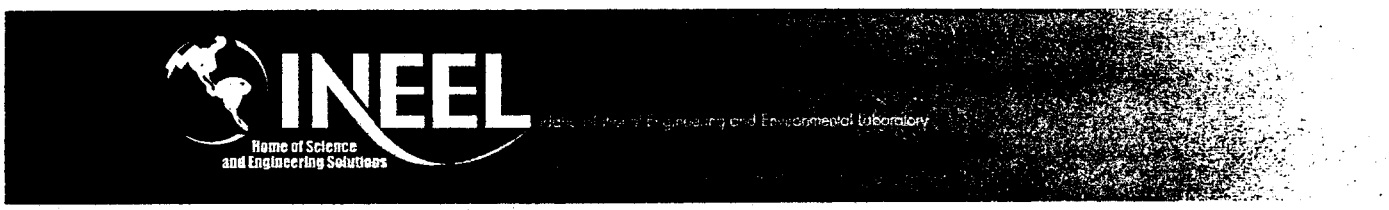
*DOE/ID-10381*
*January 2005*
*Revision 21*

U.S. Department of Energy
Idaho Operations Office

# *Idaho National Engineering and Environmental Laboratory Waste Acceptance Criteria*



DOE/ID-10381
Revision 21

# Idaho National Engineering and Environmental Laboratory Waste Acceptance Criteria

January 2005

Prepared for the
U.S. Department of Energy
Idaho Operations Office

# INEEL WAC REVISION LOG

| Revision Number | Date Approved | Pages Affected | Description of Revision |
|---|---|---|---|
| 0 | 10/27/93<br>DOE-ID Letter<br>OPE/WMPO-93-46 | | Initial Issue, Phase I, of INEL-WAC, DOE-ID 10381 included only acceptance criteria for mixed waste. |
| 1 | 2/25/94<br>DOE-ID Letter<br>OPE/WMPO-94-45 | All | Change name to INEL-RRWAC; includes acceptance criteria for all applicable INEL Facilities. |
| 2 | 5/31/94<br>DOE-ID Letter<br>OPE/WMPO-94-46 | 4.4-8, 4.6-12 | Prohibit acceptance of hazardous waste until WERF WAC is issued. See DRR-ER&WM-RS-1416. |
| 3 | 2/08/95<br>DOE-ID Letter<br>OPE/WMPO-95-46 | All | General upgrade and addition of Key Word Index. See DRR-1594 at LITCO Document Control. |
| 4 | 8/24/95<br>DOE-ID approved on DRR-2202 as requested in JVV-132-95 | pp. iii thru vii and pp. 4.6-3 thru 4.6-8 | Added limit for arsenic to acceptance criteria for MLLW to be incinerated at WERF in Table 4.6.2-2 on pg. 4.6-7. See DRR-2202 at LITCO Document Control. |
| 5 | 10/10/95<br>DOE-ID approved on DRR-2264 as requested in JVV-132-95 | All | General upgrade and addition of acceptance criteria for several LITCO treatment and storage facilities. See DRR-2264 at LITCO Document Control. |
| 6 | 02/10/96<br>DOE-ID approved on DAR-3523 as requested in MJW-04-97<br>DOE-ID Letter<br>OPE/WMPO-97-029 | All | Incorporation of RWMC and WERF/WROC SAR and permit revision requirements and a general upgrade. |
| 7 | 01/27/98<br>DOE-ID approved on DAR-5067 as requested in MJW-145-97<br>DOE-ID Letter<br>OPE/WM-98-011 | | |
| 8 | 10/27/98<br>DOE-ID approval on DARs 15426 and 16036 | viii, 4.5-2, 4.5-18, 4.5-19 | (1) Added definition of PCB bulk product waste, (2) revised the glue requirement for INEEL Wooden Waste Package Closure, and (3) incorporated the change in 40 CFR 761 revising limits pertaining to PCB disposal. |

| Revision Number | Date Approved | Pages Affected | Description of Revision |
|---|---|---|---|
| 9 | 03/29/99<br>DOE-ID approval on<br>DAR 16728 | | Incorporation of Waste Generator Services. General upgrades, including corrections to criterion relating to IWTS use, transportation, waste receipt, compliance to RCRA Permits, and the removal of unnecessary criterion and redundancy. |
| 10 | 11/10/99<br>DOE-ID approval on<br>DAR 19195 | All | Partial implementation of DOE O 435.1. Removed two criteria without drivers, the calculation of PCB weight Fractions in LLW for disposal and the identification and quantification of Ba-137m. Implemented 32 CFR 527.32 and .34, infectious substances and etiological agent disposal requirements, as appropriate. Completed implementation of PCB regulatory charges and revised a asbestos criterion per EPA 340/1-90-019. |
| 11 | 06/27/00<br>DOE-ID approval on<br>DAR 46296 | All | Final implementation of DOE 435.1, and incorporate changes to the RWMC and WROC Permits. |
| 12 | 02/15/01<br>DOE-ID approval on<br>DAR 70200 | All | Incorporate changes to the RWMC and WROC Permits. |
| 13 | 05/29/02<br>DOE-ID approval on<br>DAR 85391 | All | Annual update, complete rework of document. |
| 14 | 09/05/02<br>DOE-ID approval on<br>DARs 94790 and 94791 | Name<br>Section 4.1 and 4.2 | Remove Reusable Property and Recyclable Materials from Name.<br>Reference MCP in sections 4.1 and 4.2 |
| 15 | 12/02/02<br>DOE-ID approval on<br>DAR 96869 | Table 4.10.4-1 | In the left hand column of this table, change the top U-233 to Pu-239 and the bottom Pu-239 to U-233. |
| 16 | 12/20/02<br>DOE-ID approval on<br>DAR 97104 | Section 2.1.1 | Add paragraph to end of section to implement requirement in accordance with the DOE-HQ Immediate Risk Reduction Action Plan IRRAP 002-02. |
| 17 | 04/24/03<br>DOE-ID approval on<br>DAR 99748 | Table 4.6.3-2 | Correct data for INEEL wooden boxes. Change Gross Weight from 12,000 to 12,800 lb and Criterion Basis from EDF-541 to SPC-1512. |
| 18 | 05/20/03<br>DAR 98371 | xiii, 19, 24, 51-54 | Add section for OU 7-10 project. |

| Revision Number | Date Approved | Pages Affected | Description of Revision |
|---|---|---|---|
| 19 | 04/08/04<br>DAR 100665 | All | Changes and deletions made because WWSB, WMSF, and PSUs no longer exist.<br>The original document number, DOE/ID-10381, remained unchanged through the first twelve revisions of this document. For Rev. 13, however, the number changed to DOE/ID-01-10381. The document has carried this incorrect identifier through Rev. 18. The original document number was restored in this revision to DOE/ID-10381 in April 2004. |
| 20 | DAR 300459 | Section 4.4.4.1.b<br>Table 4.6.2<br>Table 4.6.3<br>Section 4.10.1.6 | Minor editorial changes. Changed micro-curies to nano-curies and ft to in. in respective sections. |
| 21 | DAR 116375 | Section 3.2.1.10<br>3.2.11<br>4.9.2<br>4.9.1.2.d<br>4.9.1<br>5 Reference | Change annual review requirement<br>Add Recharacterization requirement<br>Change ILWMS acceptance criteria to PRD-166<br>Remove RCRA requirement<br>Clarify statement<br>Correct reference title |

This page intentionally left blank.

# ABSTRACT

This Idaho National Engineering and Environmental Laboratory (INEEL) Waste Acceptance Criteria addresses the following:

- Waste characterization requirements
- Requirements for transferring or dispositioning property or material, owned by the U.S. Department of Energy at the INEEL
- Waste Acceptance Criteria for the various facilities at the INEEL
- Packaging and labeling requirements for waste.

This page intentionally left blank.

CONTENTS

# TABLES

# ACRONYMS

| | |
|---|---|
| ANL-W | Argonne National Laboratory-West |
| BBWI | Bechtel BWXT Idaho, LLC |
| CERCLA | Comprehensive Environmental Response, Compensation, and Liability Act |
| CFA | Central Facilities Area |
| CFR | Code of Federal Regulation |
| D&D | decontamination and decommissioning |
| DEQ | Department of Environmental Quality |
| DOE | Department of Energy |
| DOE-ID | DOE, Idaho Operations Office |
| DOT | Department of Transportation |
| DQO | data quality objective |
| EDF | Engineering Design File |
| EPA | Environmental Protection Agency |
| FGE | fissile gram equivalent |
| FIFRA | Federal Insecticide, Fungicide, and Rodenticide Act |
| GI | Generator Interface |
| HCRWSF | Hazardous Chemical and Radioactive Waste Storage Facility (CPP-1619) |
| HEPA | high-efficiency particulate air |
| HFEF | Hot Fuel Examination Facility (ANLW-785) |
| HFLS | HEPA Filter Leaching System (NWCF CPP-659) |
| HLLWE | High-Level Liquid Waste Evaporator (NWCF CPP-659) |
| HLW | high-level waste |
| ICDF | INEEL CERCLA Disposal Facility |
| IDAPA | Idaho Administrative Procedures Act |
| IDPMI | Idaho Operations Office Property Management Instructions |

| | |
|---|---|
| INEEL | Idaho National Engineering and Environmental Laboratory |
| INTEC | Idaho Nuclear Technology and Engineering Center |
| IW | industrial waste |
| IWTS | Integrated Waste Tracking System |
| LDR | land disposal restrictions |
| LET&D | Liquid Effluent Treatment and Disposal (CPP-1618) |
| LLW | low-level waste |
| LSA | low specific activity |
| M&WCP | Material and Waste Certification Profile |
| MCP | management control procedure |
| MLLW | mixed low-level waste |
| MSDS | material safety data sheet |
| MTRU | mixed transuranic waste |
| NESHAP | National Emission Standards for Hazardous Air Pollutants |
| NRC | Nuclear Regulatory Commission |
| NRF | Naval Reactor Facility |
| NWCF | New Waste Calcining Facility (CPP-659) |
| PA | performance assessment |
| PCB | polychlorinated biphenyl |
| PCM | petroleum contaminated material |
| PE-Ci | Plutonium-239 equivalent activity in curies |
| PEWE | Process Equipment Waste Evaporator (CPP-604) |
| RADCON | radiological control |
| RAL | Remote Analytical Laboratory (CPP-684) |
| RCRA | Resource Conservation and Recovery Act |
| RMWSF | Radioactive Mixed Waste Staging Facility (CPP-1617) |

| | |
|---|---|
| RWMC | Radioactive Waste Management Complex |
| SAR | Safety Analysis Report |
| SMO | Sample Management Office |
| TAN | Test Area North |
| TCLP | toxicity characteristic leaching procedure |
| TDOP | Ten Drum Overpack |
| TFF | Tank Farm Facility |
| TID | tamper indicating device |
| TPH | total petroleum hydrocarbons |
| TRA | Test Reactor Area |
| TRAMPAC | TRUPACT-II authorized methods for payload control |
| TRU | transuranic |
| TRUPACT | Transuranic Package Transporter |
| TSCA | Toxic Substances Control Act |
| TSDF | Treatment, Storage, and Disposal Facility |
| VOC | volatile organic compound |
| WAC | Waste Acceptance Criteria |
| WAP | Waste Analysis Plan |
| WCP | Waste Certification Program |
| WDDF | Waste Determination and Documentation Form (Form 435.39) |
| WGS | Waste Generator Services |
| WIPP | Waste Isolation Pilot Plant |
| WIR | Waste Incidental to Reprocessing |
| WLSF | Waste Reduction Operations Complex Lead Storage Facility (PER-612) |
| WNPD | waste with no identified path to disposal |
| WROC | Waste Reduction Operations Complex |

This page intentionally left blank.

# DEFINITIONS

*Acceptable knowledge*—Acceptable knowledge can be broadly defined to include: (OSWER9938.4-03)

1. "Process knowledge." Whereby detailed information on the wastes is obtained from existing published or documented waste analysis data or studies conducted on hazardous wastes generated by processes similar to that which generated the waste. EPA lists (i.e., F, K, P, and U lists) certain hazardous wastes in 40 CFR 261. The K-listed wastes, for example, contain wastes generated from specific sources. K listed wastes, therefore, are identified by comparing the specific process that generated the waste to those processes listed in 40 CFR 261.32 (rather than conducting a chemical/physical analysis of the waste). Similarly, any waste described in the F, P, or U list has already been designated as hazardous by EPA. Therefore, with many listed wastes the application of knowledge is appropriate because the physical/chemical makeup of the waste is generally well known and consistent from facility to facility.

2. Waste analysis data obtained from facilities which send waste off site for treatment, storage, or disposal (e.g., generators).

3. The facility's records of analysis performed before the effective date of RCRA regulations. While seemingly attractive because of the potential savings associated with using existing information (such as published data), the facility must ensure that this information is current and accurate.

*Characterization*—A process of determining and documenting all pertinent constituents with their physical, radiological, and chemical characteristics, as well as the applicable Resource Conservation and Recover Act (RCRA) waste codes from 40 CFR 261.

EPA hazardous waste number—See "Waste codes."

*Etiologic agent*—a viable microorganism, or its toxin, that causes or may cause human disease. These are limited to the agents listed in 42 CFR 72.3 of the regulations of the Department of Health and Human Services.

*Excess personal property*—Personal property under control of a federal agency that is not needed by that agency for the discharge of its responsibilities (41 CFR 101-43.001-6).

*Exchange*—To replace a nonexcess personal property item by trade with the supplier of the replacement item when the value of it is used to reduce the cost of the acquired item (41 CFR 101-46.001-3).

*Fissile Material*—Plutonium-238, Plutonium-239, Plutonium-241 Uranium-233, Uranium-235, or any combination of these radionuclides. (49 CFR-173.401, Note: This definition was developed from Department of Transportation regulations based on the use of the INEEL WAC in making INEEL waste shipments. The definition is not strictly in accordance with nuclear physics text books which address, for example, the role of zero energy neutron absorption.)

*Fissionable material*—Fissionable nuclides existing in quantities and forms that lead to the major focus of nuclear criticality safety are U-233, U-235, Pu-239, and Pu-241. Fissionable nuclides of concern are Np-237, Pu-238, Pu-240, Pu-242, Am-241, Am-242m, Am-243, Cm-243, Cm-244, Cm-245, Cm-247, Cf-249, and Cf-251. Fissionable nuclides existing in isolated quantities less than potential minimum critical mass are Pa-231, U-232, U-234, Cm-246, Cf-250, Cf-252, and ES-254 (per ANSI/ANS-8.15-1981, R87, "Nuclear Criticality Control of Special Actinide Elements") (DOE O 420.1).

*Free liquid*—For hazardous waste, liquids that readily separate from the solid portion of a waste under ambient temperature and pressure (40 CFR 260.10). For low-level waste, free liquid is defined as that liquid exceeding 1% of the volume of the waste when the waste is in a disposal container, or 0.5% of the volume of the waste processed into a stable form.

*Friable asbestos*—Asbestos-containing products other than those that are nonfriable (40 CFR 61.141).

*Generator*—Organizations within DOE or managed by DOE whose act or process produces radioactive waste or transfers radioactive waste to a treatment, storage, or disposal facility (DOE O 435.1). Generators also include those DOE organizations whose act or process produces reusable property, recyclable material, industrial waste, hazardous waste, or PCB waste.

*Hazardous waste*—Solid waste designated hazardous by Environmental Protection Agency (EPA) regulations (40 CFR 261.3). Note: 40 CFR 261.3 takes four pages to define hazardous waste.

*Hazardous waste determination*—The process for determining whether a solid waste is a RCRA hazardous waste in accordance with 40 CFR 262.

*High-level waste*—Highly radioactive waste material resulting from reprocessing of spent nuclear fuel, including liquid waste produced directly in reprocessing and any solid material derived from such liquid waste that contains fission products in sufficient concentrations; and other highly radioactive material that is determined, consistent with existing law, to require permanent isolation (DOE O 435.1).

*Ignitable*—Having a characteristic of ignitability as defined in 40 CFR 261.21.

*Incompatible waste*—A waste that is unsuitable for (a) placement in a particular device or facility because it may cause corrosion of containment materials (e.g., container inner liners to tank walls) or (b) commingling with another waste or material under uncontrolled conditions because the commingling might produce heat or pressure, fire or explosion, violent reaction, toxic dusts, mists, fumes, or gases or flammable fumes or gases (40 CFR 260.10).

*Industrial waste*—Solid waste generated by industrial processes and manufacturing; industrial waste is not radioactive, hazardous or mixed waste (40 CFR 243.101).

*Lab pack*—Multiple small containers of hazardous waste in overpacked drums (40 CFR 264/265.316). Hazardous waste with the following EPA hazardous waste codes may not be placed in lab packs under the alternative lab pack treatment standards of 40 CFR 268.42(c): D009, F019, K003, K004, K005, K006, K062, K071, K100, K106, P010, P011, P012, P076, P078, U134, or U151 (40 CFR 268 Appendix IV).

*Low-level waste*—Low-level radioactive waste is radioactive waste that is not high-level radioactive waste, spent nuclear fuel, transuranic waste, byproduct material (as defined in section 11e.(2) of the Atomic Energy Act of 1954, as amended) or naturally occurring radioactive material (DOE M 435.1-1).

*Mixed waste*—Waste that contains both source, special nuclear, or by-product material subject to the *Atomic Energy Act of 1954*, as amended, and a hazardous component subject to the *Resource Conservation and Recovery Act* (DOE M 435.1-1).

*Nonfriable asbestos containing material*—Any material containing more than 1 percent asbestos as determined using the method specified in appendix E, subpart E, 40 CFR 763, Section 1, Polarized Light Microscopy, that, when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure (40 CFR 61.141).

*Nonstandard waste container*—A container that does not meet the receiving facility Waste Acceptance Criteria for a given waste type. This definition is not specifically related to the Department of Transportation requirements.

*Overpack*—An additional container enclosing a package. When offered for transportation, see 49 CFR 173.25.

*Package*—The packaging together with its contents as presented for transport (49 CFR 173.403).

*Packaging*—The assembly of components necessary to ensure compliance with the packaging requirements of 49 CFR 173.403. It may consist of one or more receptacles, absorbent materials, spacing structures, thermal insulation, radiation shielding, service equipment for filling, emptying, venting and pressure relief, and devices for cooling or absorbing mechanical shocks. The conveyance, tie-down system, and auxiliary equipment may sometimes be designated as part of the packaging (49 CFR 173.403).

*PCB bulk product waste*—Waste derived from manufactured products containing PCBs in a nonliquid state, at any concentration where the concentration at the time of designation for disposal was greater than or equal to 50 ppm PCBs. PCB bulk product waste does not include PCBs or PCB items regulated for disposal under 40 CFR 761.60(a) through (c), Sec. 761.61, Sec. 761.63, or Sec. 761.64 (40 CFR 761.3). Examples of PCB bulk product waste include (but are not limited to):

1. Fluorescent light ballasts containing PCBs in the potting material only. Care must be taken to insure the capacitor in the light ballast is PCB free.

2. Plastics, applied dried paints, sealants, caulking, insulation.

3. Nonliquid bulk waste or debris from building demolition that contains PCBs.

*PCB remediation waste*—Waste containing PCBs as a result of a spill, release, or other unauthorized disposal at the following concentrations: materials disposed of prior to April 18, 1978 that are currently at concentrations ≥50 ppm PCBs, regardless of concentration of the original spill; materials currently at any volume or concentration where the original sources were ≥500 ppm PCBs beginning April 18, 1978 or ≥50 ppm PCBs beginning on July 2, 1979; and material currently at any concentration if the PCBs are spilled or released from a source not authorized for use under this part. PCB remediation waste means soil, rags, and other debris generated as a result of any PCB spill cleanup, including, but not limited to (40 CFR 761.3):

1. Environmental media containing PCBs, such as soil and gravel, and dredged materials such as sediments, settled sediment fines, and aqueous decantate from sediments.

2. Sewage sludge containing <50 ppm PCBs and not in use according to 40 CFR 761.20(a)(4); PCB sewage sludge; commercial or industrial sludge contaminated as the result of a spill of PCBs, including sludge located in or removed from any pollution control device; and aqueous decantate from an industrial sludge.

3. Buildings and other manmade structures (such as concrete floors, wood floors, or walls contaminated from a leaking PCB or PCB-contaminated transformer), porous surfaces, and nonporous surfaces.

*Personal property*—Items of any kind which are government-owned or rented or leased to the United States and in the custody of INEEL, except real property, records, source material, or special nuclear material. (MCP-2466, "Control of INEEL/Government Property").

*Pressurized container*—Containers that are pressurized or have the potential to become pressurized.

*Pyrophoric material*—A liquid or solid that, even in small quantities and without an external ignition source, can ignite within 5 minutes after coming in contact with air when tested according to paragraph 3.a.(1) or 3.a.(2), as appropriate, of Subpart E to 49 CFR 173 [49 CFR 173.124(b)(1)].

*Radioactive waste*—Any garbage, refuse, sludge, and other discarded material, including solid, liquid, semisolid, or contained gaseous material that must be managed for its radioactive content (DOE O 435.1).

*RCRA waste codes*—See waste codes.

*Real property*—Fixed plant assets, including related personal property, that are permanent in nature including land, buildings, and other structures and facilities owned or leased to the United States in the custody of INEEL. Real property includes any interest in land, together with the improvements, structures, and fixtures located on it (including prefabricated movable structures; such as Butler type storage warehouses, Quonset huts and trailer houses, with or without undercarriages), and its appurtenances, under the control of any federal agency, except for exemptions noted in 41 CFR 101-47.103-12, (MCP-2465).

*Recyclable material*—A material that can be used, reused, or reclaimed as defined in 40 CFR 261.1.

*Remediation waste*—All solid and hazardous waste and all media (including groundwater, surface water, soils, and sediments) and debris that contain listed hazardous wastes or that themselves exhibit a hazardous characteristic and are managed for implementing cleanup. (40 CFR 260.10)

*Residue material*—The minimal amount of material remaining after the balance of the material has been removed through such processes as evaporation, draining, combustion, distillation, or filtration (McGraw-Hill, *Dictionary of Scientific and Technical Terms*).

*Scrap metal*—Bits and pieces of metal parts (e.g., bars, turnings, rods, sheets, wire) or metal pieces that may be combined together with bolts or soldering (e.g., radiators, scrap automobiles, railroad box cars), which when worn or superfluous can be recycled. (40 CFR 261.1).

*Shipping paper*—As described in 49 CFR 171.8.

*Source Material*—(1) Uranium or thorium, or any combination thereof, in any physical or chemical form or (2) ores which contain by weight one-twentieth of one percent (0.05%) or more of (i) uranium,

(ii) thorium or (iii) any combination thereof. Source material does not include special nuclear material (DOE M 435.1-1).

*Special Nuclear Material*—(1) Plutonium, uranium enriched in the isotope 233 or in the isotope 235, and any other material which is determined pursuant to the provisions of Section 51 (of the Atomic Energy Act of 1954, as amended), to be special nuclear material, but does not include source material; or (2) any material artificially enriched by any of the foregoing, but does not include source material (DOE M 435.1-1).

*Spent nuclear fuel*—Fuel that has been withdrawn from a nuclear reactor following irradiation, the constituent elements of which have not been separated by reprocessing. Test specimens of fissionable material irradiated for research and development only, and not production of power or plutonium, may be classified as waste and managed in accordance with the requirements of DOE O 435.1 when it is technically infeasible, cost prohibitive, or would increase worker exposure to separate the remaining test specimens from other contaminated material (DOE O 435.1).

*Standard container*—A container that meets receiving facility Waste Acceptance Criteria for a given waste type. This definition is not related to the Department of Transportation requirements.

*Storage unit*—A discrete part or subset of a storage facility (IWTS).

*Transport de*vice—A reusable device used to transport waste or waste containers.

*Transuranic waste*—Transuranic waste is radioactive waste containing more than 100 nanocuries (3700 becquerels) of alpha-emitting transuranic isotopes per gram of waste, with half-lives greater than 20 years, except for (1) high-level radioactive waste, (2) waste that the Secretary of Energy has determined, with concurrence of the administrator of the Environmental Protection Agency, does not need the degree of isolation required by the 40 CFR 191 disposal regulations, or (3) waste that the Nuclear Regulatory Commission has approved for disposal on a case bases in accordance with 10 CFR 61. (DOE M 435.1-1)

*TSCA waste*—Waste managed only under TSCA (Toxic Substances Control Act) regulations.

*Waste codes*—Alphanumeric identifier used by the Environmental Protection Agency and the State of Idaho to identify specific waste types based on hazardous characteristics and/or the process that generated the waste (40 CFR 261).

*Waste container*—A receptacle for waste, including any liner or shielding material intended to accompany the waste in disposal (DOE O 435.1).

*Waste determination and disposition form (WDDF)*—Form used for waste determination and disposition in accordance with processes defined in Waste Generator Services - MCP-62*,* "Low-Level Waste Management," Waste Generator Services - MCP-63, "Conditional Industrial Waste Management," Waste Generator Services - MCP-69, "Hazardous Waste Management," and Waste Generator Services – MCP-70, "Mixed Low-Level Waste Management*.*"

*Waste incidental to reprocessing*—Waste resulting from reprocessing of spent nuclear fuel that is determined to be incidental to reprocessing is not high-level waste, and shall be managed under DOE's regulatory authority in accordance with the requirements for transuranic waste or low-level waste, as appropriate. When determining whether spent nuclear fuel reprocessing plant wastes shall be managed as

another waste type or as high-level waste, either the citation or evaluation process defined in DOE O 435.1-1 Chapter II is used (DOE O 435.1, DOE O 435.A).

*Waste minimization*—The reduction, to the extent feasible, of waste that is generated and subsequently treated, stored, or disposed of. It includes any source reduction or recycling activity resulting in either reducing the total volume or quantity of waste or reducing the toxicity of hazardous waste, or both, so long as present and future threats to human health and environment are minimized (EPA/625/7-88/003).

*Waste stream*—A waste or group of wastes from a process or a facility with similar physical, chemical, or radiological properties (DOE O 435.1).

*Waste with no identified path to disposal (WNPD)*—Waste that has been characterized to the requirements of existing or authorized disposal sites and has been determined unacceptable due to its nuclear, biological, or chemical characterization. Alternatives for each technical basis for rejection have been identified to ensure that all disposal opportunities have been addressed. Nontechnical barriers to disposal are not accepted as justification for WNPD determination (DOE O 435.1).

# Idaho National Engineering and Environmental Laboratory Waste Acceptance Criteria

## 1. INTRODUCTION

This section describes the purpose and the policy for the Idaho National Engineering and Environmental Laboratory Waste Acceptance Criteria (INEEL WAC). The INEEL WAC requirements are binding on all entities authorized to use the facilities listed in this document. These entities are also responsible for promulgating the INEEL WAC and any applicable procedures to their subcontractors or outside contractors/generators.

The INEEL WAC does not address Waste Acceptance Criteria (WAC) for wastes destined for the INEEL Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Disposal Facility (ICDF). The ICDF is only authorized to accept INEEL CERCLA generated waste (e.g., soil, tanks, pumps, and liquids). Non-CERCLA waste is not a candidate for the ICDF. Wastes generated from CERCLA activities may be stored pending disposal at the ICDF or offsite. The ICDF specific Waste Acceptance Criteria are found in DOE/ID-10881, ICDF Waste Acceptance Criteria; DOE/ID-10865, ICDF Landfill WAC; and DOE/ID-10866, Evaporation Pond WAC.

The INEEL WAC does not address liquid waste handled by sewage treatment plants, septic tanks, evaporation or percolation ponds.

The basic waste and material types addressed by acceptance criteria in this document are

1. Reusable personal property
2. Recyclable material
3. Conditional industrial waste
4. Hazardous waste
5. Low-level waste
6. Mixed low-level waste
7. Radioactive/Hazardous liquid waste
8. PCB waste
9. Transuranic waste
10. Mixed transuranic waste
11. High-level waste.

Generators of these materials and wastes are responsible for properly identifying and segregating the material and waste to meet the appropriate acceptance criteria. The Waste Generator Services (WGS) organization helps generators comply with these criteria and should always be contacted for assistance.

Using WGS streamlines material and waste acceptance processes; WGS offers material and waste generators turnkey management services through a single organization.

## 1.1 Purpose

The INEEL WAC defines the Department of Energy Idaho Operations Office (DOE-ID) acceptance criteria for waste to be received by the INEEL. Offsite-facilities will have additional acceptance requirements not addressed in this INEEL WAC. Waste acceptance is also subject to capacity and operational limitation of the receiving facility.

## 1.2 Policy

The policy of the INEEL is to ensure compliance with the following:

1. The first priority of DOE and the primary responsibility of the generator is to prevent unnecessary generation of waste and to minimize the volume and toxicity of such material at the source consistent with the current waste minimization and pollution prevention program.

2. Authorization from the receiving facility must be obtained before shipping any materials or packages.

3. DOE-ID approval is required prior to acceptance of any non-INEEL waste at an INEEL facility.

4. Any metal that has been in a radiological control area must comply with the DOE-HQ metals recycling moratorium.

## 1.3 Configuration Management

This document is maintained under configuration control. Controlled copies of this document are in electronic format only. Access at the INEEL is through URL "http://titanic/dmcs/rrwac/pdf" or "http://titanic.inel.gov/dmcs/rrwac.pdf." Uncontrolled copies may be printed for one-time, "information only" use; however, they will be so labeled and are not to be used for official guidance in the management of any waste.

The responsibility for approving this document rests with DOE-ID. The management coordination of this document and resolution of all questions and comments to the satisfaction of DOE-ID is the responsibility of the operating contractor. Since this document is a compilation of acceptance criteria from several facilities, revisions to specific acceptance criteria sections may be made without opening the entire document to review.

Anyone may request a change to the INEEL WAC by submitting a change request on INEEL Form 412.11, "DMS Document Action Request," or equivalent, to WGS, Mail Stop 4142.

# 2. ADMINISTRATIVE CRITERIA

Waste generators and generators of material to be recycled or exchanged must comply with this document.

The remainder of Chapter 2 does not apply to reusable property, with the exception of materials to be exchanged or recycled.

## 2.1 Generator and WGS Responsibilities

Generators and receiving organizations are jointly responsible for ensuring compliance with the INEEL WAC. Generators must contact WGS before waste is generated to ensure all requirements for pollution prevention, characterization, packaging, and receipt are identified and satisfied.

WGS responsibilities are defined in PDD-1003, "Waste Generator Services Program."

The generator has financial responsibility for costs of sampling, packaging, and delivery of material to the receiving facility. Included in these costs are characterization activities, container procurement, transport plans, shipping charges, and discrepancy resolution. Waste disposition and disposal costs may also be borne by the generator.

Generators and WGS must ensure that the material form, packaging, and documentation adhere to this INEEL WAC. Data used to document material or waste characterization must be verified, and must be legally and scientifically defensible. Currently, all Resource Conservation and Recovery Act (RCRA) hazardous waste, Toxic Substance Control Act (TSCA) waste, conditional industrial waste, and containerized low-level radioactive waste data must be entered in the Integrated Waste Tracking System (IWTS). Data must be verified to be accurate and complete. Industrial waste, transuranic waste, and high-level waste data are managed in other databases specific to each waste type.

Material that is known to be, or has a potential to be, regulated under RCRA or TSCA requires special planning. Management control procedures (MCPs) MCP-3469, "RCRA Satellite Accumulation Areas," MCP-3470, "RCRA 90-day Storage Areas," and MCP-3471, "Temporary Storage of PCB Waste" provide direction for compliant operation of RCRA satellite, RCRA 90-day storage areas and TSCA storage areas, respectively.

When verification testing of hazardous or mixed waste is performed at the generator's facility, the generator, with support from WGS, is responsible for managing and dispositioning secondary waste generated by this verification.

Waste originating from high-level waste systems may have a Waste Incidental to Reprocessing (WIR) determination to classify them as a waste type other than high-level waste. Waste Acceptance Criteria for WIR wastes will be developed in accordance with the appropriate disposal site Waste Acceptance Criteria and PLN-1036, "Waste Incidental to Reprocessing Determination Activities."

### 2.1.1 Transportation

The generator, WGS, Packaging and Transportation organization, and the transporter are responsible for complying with DOE-ID, Department of Transportation, Environmental Protection Agency, Nuclear Regulatory Commission, and State of Idaho regulations related to transportation. The requirements contained in any applicable transport plan or certificate of compliance are adhered to before shipping from the generator's facility.

Dedicated conveyance packaging and transportation systems shall be used for bulk radioactive wastes unless a detailed cost benefit analysis for a specific project or waste stream demonstrates that it would not be cost effective to do so. This requirement is in accordance with the DOE-HQ Immediate Risk Reduction Action Plan IRRAP 002-02, and designates a shipping conveyance or shipping container for reuse in transporting bulk wastes to a treatment or disposal facility.

### 2.1.2 Quality Assurance

All activities associated with the criteria in this INEEL WAC must be controlled and conducted according to the applicable requirements of DOE O 414.1, "Quality Assurance," 10 CFR 830.120 "QA Requirement and Responsibilities," and NQA-1 in a graded approach commensurate with the degree of hazard.

### 2.1.3 Waste Certification Program

Each generator of radioactive waste and radioactive recyclable materials must have a Waste Certification Program (WCP) to provide assurances that appropriate Waste Acceptance Criteria and applicable RCRA waste analysis requirements are met (DOE O 435.1).

## 2.2 Waste Generator Services Responsibilities

WGS responsibilities are defined in PDD-1003, "Waste Generator Services Program."

## 2.3 Facility Manager Responsibilities

It is the responsibility of the applicable facility manager to ensure that the criteria in this document is accurate and complete.

The facility manager of the receiving facility has final authority to accept or reject waste, because there may be other facility and operational limitations on waste and waste container management (e.g., limitations on the volume of reactive waste, limitations on flammable liquids) found in facility-specific documents, such as safety analysis reports and hazard assessments. To determine if there are additional requirements, waste generators should consult with WGS facility representatives or the applicable facility manager.

# 3. CHARACTERIZATION

This section identifies the criteria that must be satisfied to accurately profile and characterize waste.

## 3.1 General

The generator's characterization process must provide verifiable evidence of compliance with the applicable acceptance criteria.

Recyclable materials and waste must be characterized prior to or at the point of generation to ensure proper use of recyclable materials and to facilitate proper disposition of the material. The characterization must be conducted in a manner that satisfies the minimum criteria established in Section 3.2 of this document and must be performed in accordance with applicable state and federal regulations and INEEL procedures.

## 3.2 Characterization Criteria

### 3.2.1 General Criteria

1. Any item to be discarded must be evaluated to determine if it is suitable for recycling or meets the definition of a solid waste.

2. Wastes meeting the definition of a solid waste in accordance with 40 CFR 261.2 must undergo a hazardous waste determination per 40 CFR 262.11. This determination must also identify radiological and PCB characteristics.

    a. Perform a listed waste determination.

        (1) Listed wastes must be identified based on the knowledge of the process that generated the waste.

        (2) For wastes generated from nonspecific sources defined in 40 CFR 261.31, from specific sources per 40 CFR 261.32, or as a result of discarding a commercial chemical product identified in 40 CFR 261.33, the applicable listed waste code must be applied to the waste.

        (3) The applicable chemical constituents for each listed waste code associated with the waste must be identified in order to make compliant RCRA land disposal restriction determinations.

        (4) When a nonlisted waste contacts a listed waste, the mixture must carry the listed codes, regardless of the concentration of the listed constituents, unless de-listed or the requirements of the alternative debris standards are met as in the case of HEPA filter debris treatment at CPP-659. Listed codes are applied only when known contact with a listed waste has occurred. Personnel generating listed waste should consult WGS or the treatment facility for listed waste treatment information.

        (5) Presence of a listed waste constituent without known contact does not result in a waste being listed.

(6) Treatment residues generated from the treatment of a listed waste will retain the listed codes.

b. Perform characteristic waste determination.

(1) Wastes must be evaluated to determine whether they are characteristically hazardous, using either acceptable knowledge or by performing sampling and analysis using appropriate methods.

(2) Wastes must have the applicable characteristic codes applied based on the results of the evaluation.

(3) Treatment residues generated from the treatment of characteristic wastes must be evaluated to determine whether they exhibit a characteristic. D-codes do not automatically carry through to a treatment residue. Only residues that exhibit a characteristic must carry a D-code.

(4) Mixtures of solid waste and characteristic waste must carry D-codes only if the mixture exhibits a characteristic.

(5) When a waste is both listed and characteristic for the same constituent, the listed waste code and applicable land disposal restriction treatment standard must apply in lieu of the D-code. In these instances, the D-code must not be applied to the waste.

(6) When a listed waste exhibits the characteristic of ignitability, the D001 code must be applied to the waste stream in addition to the listed codes.

(7) If a waste is determined to be characteristically hazardous, a determination must be conducted to identify applicable underlying hazardous constituents.

3. Based on acceptable knowledge, special RCRA analysis (SW-846 or equivalent regulatory agency approved methods); all applicable RCRA waste codes must be identified and documented in accordance with 40 CFR 261 and 40 CFR 268 requirements.

4. The generator is responsible for determining the appropriate sampling method, conducting all field sampling with appropriate quality assurance/quality control procedures, arranging for and coordinating with appropriate analytical laboratories, and documenting the sampling and analysis activities and results.

5. Identify whether a waste is radiologically contaminated or activated.

6. Identify PCB concentrations.

7. Using data from the hazardous waste determination, radiological characterization, and other parameters such as PCB concentration and overall waste type, individual wastes must be assigned to a specific waste stream. Waste streams are recorded as material profile numbers in the IWTS database. Exception: HLW waste is not tracked in IWTS.

8. Characterization information supporting waste determination shall be recorded on INEEL Form 435.39, “Waste Determination and Documentation Form” (WDDF).

9. High Level waste is not recorded on a WDDF.

10. An annual review and recertification of waste stream material profiles shall be conducted in accordance with paragraph 4.8 of MCP-69 for hazardous waste, paragraph 4.9 of MCP-62 for Low Level Waste. and paragraph 4.8 of MCP-70 for Mixed Waste..

11. . INTEC ILWMS require re-characterization in accordance with paragraph 4.1.1 d of MCP-70 and paragraph 4.1.1.d of MCP-62.

### 3.2.2 Acceptable Knowledge and Analytical Methods

1. Acceptable knowledge and analytical methods are used as referenced in 40 CFR 262.11.

2. Characterization should use acceptable knowledge to the extent possible. If characterization cannot be satisfied through acceptable knowledge, then detailed sampling and analysis must be used to adequately demonstrate that the characterization satisfies regulatory requirements and meets a receiving facility's Waste Acceptance Criteria.

3. When acceptable knowledge is documented and available to show that a particular constituent is not present in the waste because it is not associated with the process that produced the waste, there is no requirement to test for that constituent. Acceptable knowledge can be documented with a detailed process description or with published data for the process.

4. Acceptable knowledge that is adequate for one waste stream may be inadequate for another waste stream, due to the presence of additional constituents, different generating processes, etc. Examples of acceptable knowledge include the following:

    a. Generating process records where chemical types and quantities used in a specific process are documented, allowing for calculations to demonstrate what chemical constituents will be present in the process's waste streams. The calculations must take into account any chemical reactions that may occur during the process and affect final waste characteristics.

    b. Listed waste determinations made using acceptable knowledge by comparing the process that generated the waste with the processes defined in 40 CFR 261.31 and 40 CFR 261.32. If discarding an unused commercial chemical product, 40 CFR 261.33 must be reviewed to determine if the chemical is considered a P- or a U-listed waste.

    c. Documented knowledge of contamination from a known listed waste source. If a solid waste contacts a listed waste, the resulting mixture will also be a listed waste.

    d. Product information from material safety data sheets (MSDSs) typically does not address chemicals present at concentrations of less than 1%. Most D-code chemical constituents are regulated well below 1% (10,000 ppm), so there is potential for a chemical product to contain RCRA regulated constituents not addressed on the MSDS.

    e. Often, analytical methods other than approved methods or EPA methods not performed under a Quality Assurance Project Plan can provide adequate data to show whether or not a chemical is present in a waste stream above regulatory limits. These methods may include laboratory processes and field verification methods, such as using litmus paper as an

indicator of pH or head-space gas sampling to determine the presence of organic constituents in a waste stream. This type of sampling and analysis should be considered acceptable knowledge.

f. Operating procedures that address waste stream form and constituents provide acceptable knowledge.

5. If sufficient characterization data cannot be obtained to define the waste stream through acceptable knowledge, RCRA sampling and analysis protocol must be used.

   a. Generators funded by DOE Environmental Management (EM), per DOE-ID letter OPE-EM-58-96, must obtain all RCRA analytical services either from subcontracted laboratories or from INEEL laboratories through the Sample Management Office.

   b. Waste characterization analysis must be performed in accordance with PRD-5030 and MCP-3480.

   c. The Sample Management Office is responsible to ensure that the laboratory has been audited both prior to initial subcontract award and annually and to ensure that the laboratory's performance is monitored against set criteria.

   d. Characterization conforming to RCRA sampling and analysis requirements must be performed in accordance with the applicable RCRA permit.

   e. When RCRA sampling and analysis is required, the laboratory must be able to produce documented evidence that the personnel and laboratory are qualified to perform the analysis.

   f. Field sampling quality assurance/quality control measures must be implemented.

   g. Records of all sampling and analysis activities must be maintained as a quality record.

### 3.2.3 Land Disposal Restriction Criteria

1. If waste is determined to be RCRA hazardous waste, it is necessary to determine and document at the point of generation which Land Disposal Restrictions (LDRs) apply (40 CFR 268.7(a)(3)).

2. If LDRs apply, conduct an LDR assessment per 40 CFR 262.11 and 40 CFR 268.7. Identify and document all applicable LDR standards, including:

   a. LDR waste description and treatment/regulatory subcategory per 40 CFR 268.40

   b. LDR treatability group (wastewater or nonwastewater)

   c. Whether the waste meets LDR treatment standards

   d. Whether the waste is RCRA debris suitable for the alternative treatment standards specified under 40 CFR 268.45.

3. Using either acceptable knowledge or analytical methods, all underlying hazardous constituents (UHCs) listed in 40 CFR 268.48 that are reasonably expected to be present in characteristically hazardous waste at the initial point of generation must be identified. Only UHCs present in the waste at the initial point of generation need to be identified. If a waste is partially treated prior to

disposition and other UHCs may have been added or concentrated as part of the treatment process, these constituents need not be identified so long as a new waste stream has not been generated. Only waste at a new point of generation must be evaluated for UHCs.

4. When a waste is both listed and characteristic for the same constituent, the listed waste LDR treatment standard applies in lieu of the characteristic code treatment standard; if the treatment standard for the listing addresses the treatment standard for the characteristic constituent. Therefore, if the waste is not characteristic for any other constituent, UHCs do not apply to the waste.

## 3.3 Characterization Records

Records, statements, reports, and data that support characterization are maintained by the generator in auditable files and are quality records.

Each material profile for industrial waste, hazardous waste, mixed low-level waste, TSCA waste, and low-level radioactive waste is maintained as a quality record in the IWTS. In addition, a hard copy file for each of these material profiles is maintained. The following documents will be placed in the hard copy file when created:

1. Copies of Waste Determination and Disposition Forms applicable to waste generated under the material profile.

2. Analytical data used to characterize the waste.

3. Supporting documentation used for making acceptable knowledge determination.

4. Applicable correspondence concerning waste characterization.

5. Shipping profile information as it becomes available.

6. Waste verification data.

Characterization data is communicated to the receiving facility in a form acceptable to WGS and the receiving facility.

# 4. ACCEPTANCE CRITERIA

This section compiles specific acceptance criteria waste to be received at INEEL facilities. These criteria are based on applicable regulations, DOE orders, and the receiving facility's requirements.

## 4.1 Reusable Personal Property

### 4.1.1 Reusable Personal Property

For reusable government property please refer to the following management control procedures:

1. MCP-2466, INEEL/Government Property

2. MCP-2478, Disposing of Non-proliferation Sensitive Government Personal Property

3. MCP-3689, Material Exchange Program.

### 4.1.2 Lead Shielding to be Shipped to WLSF

The Waste Reduction Operation Complex Lead Storage Facility (WLSF) maintains a supply of clean and radioactively contaminated lead shielding for INEEL use.

The following acceptance criteria must be met before shipping lead shielding to the WLSF:

1. Lead shielding is

    a. In "as new condition"

    b. Segregated and packaged per shape, brick, shot, blankets, etc.

2. Lead shipped to the WLSF must be packaged in accordance with the following criteria:

    a. Authorized packaging includes pre-approved metal boxes and a wooden box per INEEL Drawing 447408, and others as approved by the WLSF manager on a case-by-case basis.

    b. DOT quality requirements are met if lead is less than 100 microns in size. (49 CFR 173.474 and 49 CFR 173.475).

    c. Wooden boxes are painted with near-white, exterior, fire-retardant paint, approximately 0.007 in. thick and have a flame-spread rating of 25 to 75 per American Society for Testing and Materials (ASTM) E-84 (WM-F1-82-005, Uniform Fire Code Section 8003).

    d. Closure specified in 49 CFR 173.475 is met.

    e. Gross weight does not exceed 5,500 pounds (WLSF forklift load limit).

    f. A plastic liner is installed to prevent contamination of the box (WLSF facility requirement).

g. The following information must be placed on the top and opposite side(s) of each container so that the information for each container is always visible, legibly printed, stenciled, or neatly hand-lettered (facility requirement unless otherwise noted).

(1) Correct DOT markings if lead is less than 100 microns in size (49 CFR 172, Subpart D) and labels (49 CFR 172, Subpart E)

(2) Waste package gross weight

(3) INEEL shipper's complete name and address

(4) Unique container identification number

(5) Maximum radiation level at contact and at 1 meter in air.

3. The following documentation accompanies the shipment:

a. Shipping papers, if lead is less than 100 microns in size. (49 CFR 172.202, 203, 204)

b. An inventory list detailing by item the contents of each package (facility requirement).

c. For clean lead only, a properly completed INEEL Form 435.02, "No Radioactivity Added Certification," allowing free release to unrestricted areas.

## 4.2 Recyclable Material

For recyclable material and universal waste refer to the following:

1. MCP-454, "INEEL Recycling Procedure."

2. DOE/ID 10333(00), "INEEL Pollution Prevention Plan."

3. MCP-9374, "Management of Universal Waste."

## 4.3 Industrial Waste

Industrial waste (IW) generated at the INEEL is disposed at the INEEL Landfill Complex. IW generated in Idaho Falls facilities is disposed in the Bonneville County Landfill.

### 4.3.1 Background

IW is generated by a wide variety of activities and operations, and is one the largest and most diverse waste streams managed at the INEEL. Based on its diverse nature and the history of particular generating activities and locations, some IW streams have a higher probability to contain components restricted from disposal at the INEEL IW Landfill Complex (i.e., hazardous waste constituents, PCBs, and/or radiological contamination). IW streams that have a higher probability to contain these components are restricted from disposal until a waste stream-specific waste determination is completed and it is demonstrated that the waste stream does not contain restricted components, supporting classification and disposal as IW.

All IW destined for disposal at the INEEL requires a documented waste determination. A documented waste determination is in place for general industrial waste generated at the INEEL and

Idaho Falls facilities. For the most part, this IW is collected through the industrial waste collection dumpsters. Training is provided to all INEEL employees to understand the requirements of what waste can be discarded as IW. Additionally, waste acceptance signs on collection dumpsters describe acceptable and prohibited items. Also, INEEL Landfill Operations perform periodic waste inspections of received waste to validate that the waste meets acceptance and waste determination criteria. This provides the basis of ensuring that the IW generated meets waste determination and waste acceptance parameters and requirements. Again, IW waste streams that have a higher probability of containing constituents restricted from disposal require a waste stream-specific hazardous waste determination. These waste items are described in this section.

### 4.3.2 Acceptance Criteria – INEEL IW Landfill Complex

The following criteria apply to all IW to be disposed at the INEEL IW Landfill Complex:

1. The waste does not contain radioactive items that exceed the radioactivity limits for unrestricted release of items and materials according to the *INEEL Radiological Control Manual*, BBWI Manual 15A, or DOE/EH-0256T, Table 2-2.

2. In order to minimize the potential for groundwater contamination, liquids other than unavoidable rain and snow are not accepted at the landfill without justification and WGS approval. (IDAPA 58.01.11)

3. The waste does not contain any of the following:

    a. Wastes exhibiting a RCRA characteristic defined in 40 CFR 261 Subpart C, including ignitability, corrosivity, or reactivity or that contain RCRA-regulated toxicity characteristic constituents in concentrations above those specified in 40 CFR 261.24 (40 CFR 261).

    b. RCRA-listed waste defined in 40 CFR 261, Subpart D.

    c. Metallic lead or terneplated oil filters (40 CFR 261).

    d. Inflatable rubber tires (auto, truck) (IDPMI 48).

    e. Batteries, except for “mercury free” or “zero mercury added” carbon-zinc or alkaline batteries (40 CFR 261).

    f. Printed circuit boards (40 CFR 261).

    g. PCBs ≥50 ppm (40 CFR 761.60) except for PCB Bulk Product Waste (40 CFR 761.62(b)(1)).

    h. Waste from spills of PCB liquids that are ≥50 ppm PCBs (40 CFR 761).

    i. Wood or metal pieces with the largest dimension greater than 8 ft (IDPMI 48). Before cutting an item to meet this criterion, the generator should contact the Property Reutilization and Disposal Office to determine if it can accept the item for reuse.

    j. Reusable or recyclable wood/lumber (IDPMI 48).

    k. Refrigeration equipment containing refrigerant and lubricating oils (40 CFR 82.156).

    l. Communication cable containing lead (40 CFR 261).

m. Used or unused medical sharps (anything used to inject, draw blood, or cut or scrape tissue, such as needles and scalpels) (DOE P 450.4).

n. Infectious substances and etiological agents that have not been rendered nonhazardous by disinfecting or sterilization (32 CFR 627.32 and 627.34).

4. Empty containers greater than one gallon must have plugs or lids removed (ISMS Safety Concern).

5. Empty containers that have held hazardous materials and/or have been pressurized have been emptied in accordance with 40 CFR 261.7 and transported in accordance with 49 CFR 173.29.

6. Paper containing sensitive unclassified information is sealed in a box or manila envelope and is addressed using INEEL Form 473.73, "Checklist For Unclassified/Sensitive Information Recycle/Destroy" (sticker), with the generator's name, mail stop, and return address. Small quantities can be mailed through INEEL base freight. Call 526-9925 for arrangements.

7. Dumpsters that hold wood and metal are segregated and the contents are nonrecyclable and nonreusable (IDPMI 48).

The following IW streams are allowed to be disposed in the Industrial Waste Landfill and are specifically included in the general waste determination for industrial waste:

1. Carbon-zinc and alkaline batteries

   a. Are clearly marked "ZMA" (zero mercury added), "mercury free," or display the "green" tree

   b. Are manufactured in the United States after 1993

   c. Polaroid film pack batteries manufactured after 1988.

2. Only the following brands and models of spent fluorescent tubes/lamps: Phillips ALTO, G.E. ECOLUX, Oram Sylvania ECOLOGIC

3. Bulk shipment of the following items:

   a. Fresh concrete rinsate

   b. Unpainted/untreated wood waste from carpenter shops

   c. Sensitive unclassified paper waste

   d. Clean topsoil.

The following common waste items at the INEEL require a waste stream-specific documented waste determination. Criteria for accepting several of these items is also provided. This is not an all-inclusive list and other waste could require a documented waste stream-specific waste determination based upon the graded approach applied. Please contact WGS for assistance.

1. Nontraining-related personal protective equipment, including anti-C clothing, and nontraining-related items marked with a radiation symbol (other than documents) (10 CFR 835.605).

2. Debris such as concrete, masonry, asphalt, wood, soil, and gravel.

3. Engine Oil Filters. These filters must have been gravity hot-drained using a method prescribed in 40 CFR 261.4(b)(13).

4. Fuel filters, transmission oil filters, and specialty filters.

5. Vegetable oil and grease which must be congealed in solid form and contained in a closed metal or plastic container (NPDES Storm Waste Multi-Sector General Permit for Industrial Activities FR Vol. 65).

6. Refrigeration equipment meeting the following requirements:

    a. Regulated chlorofluorocarbon (Freon type) refrigerant and oils have been removed by an EPA-certified technician (40 CFR 82.156).

    b. Fluid filled capacitors not marked "No PCBs" have been removed.

    c. INEEL Form 435.35, "Refrigeration/Air Conditioning Appliance Disposal Certification," is completed and submitted to the INEEL Landfill Complex Office (40 CFR 82.156).

7. Pharmaceuticals or medications from INEEL medical services.

8. Animal carcasses larger than coyote size (32 CFR 627).

9. Communications cable, metal solder, brass or bronze, and printed circuit boards.

10. Incandescent light bulbs, fluorescent tubes, and high-intensity lamps (40 CFR 261).

11. High-efficiency particulate air (HEPA) filters, including metal frames.

12. Fluid-filled capacitors (40 CFR 268 and 40 CFR 761.60).

13. Containers that have held hazardous materials.

14. Asbestos-containing materials have been removed in accordance with MCP-3480. (40 CFR 61) meeting the following requirements.

    Category I and II nonfriable asbestos containing material:

    a. Meets the requirements of 40 CFR 61 Subpart M

    b. Can be sent in bulk conveyance to the landfill for disposal as non-NESHAP regulated waste

    c. A 24-hour notice to the Landfill facility operator precedes delivery.

15. Asbestos-containing materials for disposal at the INEEL Asbestos Landfill. (40 CFR 61).

    Nonfriable and friable asbestos meeting the following requirements:

    a. Friable waste is packaged in bags or other nonrigid packages that are dust and sift proof. All asbestos wastes are contained in strong tight packaging (adapted for 40 CFR 61.150(a)(1)(iii), 40 CFR 61.154(e)(1)(iv), 49 CFR 173.216(c)(4)) and EPA340/1-90-019 and

    b. Meets the requirements of 40 CFR 61 Subpart M

    c. The packages are exempt from free liquid criteria for the landfill.

    d. Packaging is labeled per 49 CFR 172.101 (see also 29 CFR 1910.1200, Appendix E) and includes the following information:

        (1) DANGER
        CONTAINS ASBESTOS FIBERS
        AVOID CREATING DUST
        CANCER AND LUNG DISEASE HAZARD

        (2) Name and address of generator.

    e. The words "friable asbestos" are included on the packaging containing friable asbestos (29 CFR 1910.1200, Appendix E) and in the applicable section of INEEL Form 435.39.

    Friable asbestos must also be accompanied by a completed INEEL shipping document and the approved Material Profile Data Sheet.

16. Petroleum-containing material (PCM), such as, soil, sand, gravel, or other earthen material to undergo land farming meeting the following requirements:

    a. Must be characterized for the constituents listed in Idaho Department of Health and Welfare, Division of Environmental Quality (DEQ), "Guidelines for TPH Analysis of Petroleum Contaminated Soils," 1992 and for any other analyses required by the receiving organization, as documented on a Material Profile Data Sheet.

    b. Has been approved by DOE-ID and the Idaho Department of Environmental Quality (DEQ).

17. Industrial waste requiring a waste stream-specific waste determination shall have a documented waste determination accompanied by a copy of a signed Material Profile Data Sheet and the completed generator part of INEEL Form 435.27, "INEEL Landfill Complex Solid Waste Log" for waste acceptance.

### 4.3.3 IW to be Disposed at the Bonneville County Landfill

IW generated by Idaho Falls facilities that are disposed at the Bonneville County Landfill must meet all requirements for that landfill. Contact the WGS Idaho Falls facility representative for assistance in making any determination. Acceptance of the waste at offsite facilities does not relieve generators of their environmental liability and responsibility for regulatory compliance.

## 4.4 Packaging and Labeling of Hazardous and Radioactive Waste

### 4.4.1 General

This section specifies packaging and labeling requirements that apply to hazardous waste, radioactive waste, mixed waste, TRU or mixed TRU waste.

### 4.4.2 Packaging and Labeling Requirements for all Waste with Hazardous or Radioactive Components

1. Packaging

    a. All waste is packaged in accordance with the requirements of 49 CFR 173, DOE O 435.1, facility RCRA documents and MCP-3775.

    b. Active pathogens, infectious substances, and etiological agents have been rendered nonhazardous by disinfecting or sterilization (32 CFR 627.32 and 627.34).

    c. Surface contamination on waste, packages, and pallets does not exceed the radioactivity limits for unrestricted release of items and materials, as specified in the *INEEL Radiological Control Manual*, INEEL Manual 15A, or DOE/EH-0256T, Table 2-2. Additional radiological requirements may be imposed to meet facility specific requirements for the intended receiving facility or facilities.

    d. Floor loading limits and handling equipment capacities may limit the weights of packages that otherwise comply with DOT requirements. Load limits for the receiving facility must be determined before shipment.

    e. Hoisting and rigging meet the requirements of DOE-STD-1090-2001.

    f. Outer containers are in new or as-new condition, free of bulges, holes, swelling, significant rust, dents, or similar evidence of degradation, (49 CFR 173.475). WGS will have the final authority as to what constitutes degradation.

    g. Containers are loaded so that:

        (1) Heavy items are placed at the bottom of the container.

        (2) Liquids must have sufficient void space so that neither leakage or permanent distortion of the package or receptacle will occur as a result of expansion of the liquid caused by temperatures likely to be encountered during transportation (49 CFR 173.24 (h)).

    h. Gasketing, pressure relief, or venting requirements and provisions, if necessary, are as specified in 49 CFR 173.24. Vents or other measures are provided for each waste package that has a potential for pressurizing or generating flammable or explosive concentrations of gases within the waste container (DOE O 435.1,L.1(b)).

    i. Wooden boxes

        (1) Are listed on the approved IWTS container list.

(2) Have all exterior surfaces painted with-near white, exterior, fire retardant paint and have a flame spread rating of 25–75 according to the American Society for Testing and Materials (ASTM) E-84 (Uniform Fire Code Section 8003).

2. Labeling

a. Labels and markings are visible, legibly printed, stenciled, or neatly hand lettered (49 CFR 172.304).

b. Marking and labeling for each waste package include:

(1) Name and address of generating facility and shipper (49 CFR 172.301(a) and 40 CFR 262.32).

(2) Waste package gross weight (49 CFR 172 Subpart D).

(3) An IWTS container barcode identification number issued by WGS. The barcode number can be affixed using the actual barcode label provided by WGS, or for containers stored in areas exposed to the elements, the bar code number can be legibly handwritten or stenciled on the container.

(4) All DOT labels and markings required by 49 CFR 172, Subpart D and E.

(5) No visible extraneous markings, such as free hand spray paint markings or graffiti of any kind, on any surface of the package, except for quality inspection stamps and required markings. Extraneous markings may be painted over in lieu of removal by other means. (49 CFR 172 Subpart D)

### 4.4.3 Packaging and Labeling Requirements Applicable only to Hazardous and Mixed Waste

1. Packaging

a. Packaging is secure, leak proof, and meets the requirements of 49 CFR 173.24 and 49 CFR 173.24(a).

b. Wastes within a container are compatible with each other and with the container in which they are stored. (49 CFR 173.24(e), 49 CFR 177.848, 40 CFR 264.17, 40 CFR 264.177). Examples of resources that may be used to determine compatibility are the tables in Appendix V of 40 CFR 264, 40 CFR 265, and 49 CFR 177.848.

c. When hazardous wastes also contain TSCA-regulated concentrations of PCBs, the waste must be packaged in accordance with the requirements specified in Section 4.8.

d. Wastes with concentrations of total VOCs greater than 500 ppm by weight must meet one of the following packaging requirements (40 CFR 265.1086):

(1) The container capacity is less than 26 gallons.

(2) The container capacity is greater than 26 gallons but less than 120 gallons, and the container meets applicable requirements in 49 CFR 178.

(3) The container capacity is more than 26 gallons and does not meet applicable requirements in 49 CFR 178 but is documented to not leak VOCs after initial closure, as determined using EPA Method 21 in 40 CFR 60, Appendix A.

(4) To demonstrate compliance with these requirements for VOC concentrations, the waste must undergo a determination in accordance with 40 CFR 264/265.1084(a) or, for treated wastes, 40 CFR 265.1084(b). Alternatively, wastes that are suspected of containing VOCs greater than 500 ppm by weight based on acceptable knowledge may be packaged in accordance with the requirements specified above to ensure they meet the 40 CFR 264/265, Subpart CC requirements.

e. Lab Packs

(1) The inner containers must be nonleaking and tightly sealed. They must be made of a material that will not react with the waste contents.

(2) The overpack container must be no larger than 110 gallon and be of open head design. The container must be packed with a nonbiodegradable absorbent material of sufficient capacity to completely absorb all of the liquids in the laboratory pack.

(3) Absorbent materials must be compatible with the wastes stored in the over pack container.

(4) Only compatible waste types may be placed in the same laboratory pack.

(5) No inner lab pack container may exceed 5 gallon in volume. If a waste is packaged in a container greater than 5 gallon, it may not be laboratory packed and must be managed accordingly.

(6) The exact number of inner containers, including the volume and waste type, must be recorded in IWTS.

2. Labeling

a. Bulk shipments are marked and labeled on the bulk packaging as required by 49 CFR 172, Subpart D and E.

b. Marking and labeling for each waste package include.

(1) Properly filled out, standard RCRA hazardous waste label in accordance with 40 CFR 262.32 (49 CFR 172).

(2) Phone number of generator contact.

(3) EPA identification number (49 CFR 172).

(4) PCB-containing wastes are labeled in accordance with TSCA requirements specified in Section 4.8.

### 4.4.4 Packaging and Labeling Requirements Applicable to Waste with Radioactive Constituents

1. Packaging

    a. Surfaces of waste packages are available for loose contamination surveys, i.e., there are no barriers such as tarps, snow, ice, or water to prevent the surveys from being performed (49 CFR 173.433).

    b. Packages containing radioactive material >2 nCi/g pass the quality control inspection requirements to qualify for shipment (49 CFR 173.475).

2. Labeling

    a. Maximum radiation level at contact and at 1 meter in air (49 CFR 173 Subpart I).

    b. Instruments and equipment for isotope detection and quantification are appropriate for the respective radionuclides and meet the following applicable standards:

        (1) ASTM Designation E 181-93, "Standard General Methods for Detector Calibration and Analysis of Radionuclides."

        (2) ASTM Designation C 1000-90, "Standard Test Method for Radiochemical Determination of Uranium Isotopes in Soil by Alpha Spectrometry."

        (3) ASTM Designation C 1001-90, "Standard Test Method for Radiochemical Determination of Plutonium in Soil by Alpha Spectroscopy."

        (4) ASTM Designation C 1205-91, "Standard Test Method for the Radiochemical Determination of Americium-241 in Soil by Alpha Spectrometry."

        (5) ANSI N42.14-1991, "American National Standard Calibration and Use of Germanium Spectrometers for the Measurement of Gamma-Ray Emission Rates of Radionuclides."

## 4.5 Hazardous Waste

### 4.5.1 General

This section contains the general acceptance criteria that apply to all hazardous waste. In addition to hazardous waste, this section addresses the hazardous waste component of mixed waste and PCB waste.

1. Documentation

    a. A RCRA hazardous waste determination shall be completed, and the waste characterized in accordance with Section 3. The characterization must:

        (1) Identify applicable hazardous waste codes and underlying hazardous constituents.

(2) Be documented on INEEL Form 435.39, "Waste Determination and Documentation Form (WDDF)."

(3) Be sufficient to complete LDR notifications and certifications.

(4) Address any receiving facility-specific characterization requirements. These requirements are typically defined in the facility RCRA waste analysis plan (40 CFR 264.13/265.13).

b. A completed IWTS M&WCP for each waste stream has been submitted to, and approved by WGS (RCRA Permit).

c. A completed and approved IWTS M&WCP must be current within 12 months of the waste shipment (RCRA Permit).

d. An IWTS shipment task profile shall be completed for each waste package before shipment.

e. The following documentation accompanies each shipment of waste at the INEEL:

(1) EPA Form 8700-22, "Uniform Hazardous Waste Manifest" (40 CFR 263). If the hazardous waste contains PCBs regulated under TSCA per 40 CFR 761, the weight of the waste must be reported in kilograms on the manifest (40 CFR 761.207(a)(2)).

(2) Land Disposal Restriction (LDR) notifications and certifications required by 40 CFR 268.7 and 40 CFR 268, Subpart D, as applicable, have been submitted to and approved by the receiving organization. 40 CFR 268.7 states the required content of the applicable notices and certifications. LDR certifications provided by offsite receiving facilities are used at the INEEL. Contact WGS offsite waste shipment coordinator personnel for copies of the appropriate LDR certifications. The correct LDR certification to be used depends on a number of factors, including whether the waste is characteristic or listed, whether it meets LDR treatment standards, whether the waste has been treated, whether the waste contains underlying hazardous constituents, and whether the waste will be managed in accordance with alternative treatment standards such as debris waste or in laboratory packs. If the LDR forms supplied by the offsite vendors do not specifically address a given waste stream, prepare a form meeting all of the certification requirements defined in 40 CFR 268. Contact WGS environmental support personnel for assistance as needed.

(3) Inventory sheets for laboratory packs (RCRA Permit).

(4) IWTS shipment request and certification report.

(5) Any waste verification required by WGS is documented as complete and approved by WGS (RCRA Permit).

(6) INEEL Form 435.02, "No Radioactivity Added Certification."

2. Prohibited Material

   a. Wastes having RCRA hazardous waste codes not included in the applicable RCRA Part A Application for the proposed receiving facility (40 CFR 270).

   b. Waste is not, and does not have the potential to be, forbidden material, as defined in 49 CFR 173.21, or forbidden explosives, as defined in 49 CFR 173.54.

   c. Laboratory packs may not contain any waste that has the following EPA hazardous waste codes: D009, F019, K003, K004, K005, K006, K062, K071, K100, K106, P010, P011, P012, P076, P078, U134, U151 (40 CFR 268, Appendix IV).

### 4.5.2 Additional Criteria for Hazardous Wastes Stored in INEEL TSDFs

1. The following hazardous waste may not be stored in an INEEL TSDF:

   a. Wastes in a gaseous waste form, i.e., pressurized vessels or containers other than aerosol cans.

   b. New unused chemical products that have not been offered for material exchange.

   c. Wastes carrying the D003 code or P or U code, unless specifically approved by the receiving facility.

   d. Waste generated by non-INEEL facilities unless they have DOE approval to be stored at INEEL TSDFs.

2. Waste is not, and does not have the potential to be:

   a. DOT Class 1 explosive or Class 4 Division 4.1 flammable solid that meets the definition of a wetted explosive under 49 CFR 173.124(a)(1), as identified in 49 CFR 173, Subparts C and D (RCRA Permit).

   b. Pyrophoric material, as defined in 49 CFR 173.124(b)(1), or shock-sensitive material.

### 4.5.3 Hazardous Waste to Private Sector Facilities

INEEL generators must ensure that offsite facility acceptance criteria are met in order to ship waste to such facilities.

### 4.5.4 Hazardous Waste to be Stored at the Hazardous Chemical and Radioactive Waste Storage Facility (HCRWSF CPP-1619)

There are no additional Waste Acceptance Criteria for wastes being shipped to CPP-1619 for storage other than those identified in Section 4.5.1 and 4.5.2.

### 4.5.5 Hazardous Waste to be Treated at CPP-659 or Stored at CPP-659, CPP-1659, and CPP-666

In addition to meeting all the criteria of Section 4.5.1 and 4.5.2, the following acceptance criteria must also be met for hazardous waste to be debris treated at CPP-659 or stored at CPP-659, -1659, and -666. Wastes must comply with 40 CFR 268.3, “dilution prohibition” (RCRA Permit).

1. Waste does not contain:

    a. Free liquids or liquid-bearing wastes (RCRA Permit)

    b. PCB-contaminated debris at concentrations >2 ppm (RCRA Permit)

    c. Items that do not meet the definition of "debris" as defined in 40 CFR 268.2 (g), (RCRA Permit)

    d. Items that will generate liquid treatment residuals that do not comply with the requirements of downstream TSDFs or have an identified path to disposal (RCRA Permit)

    e. Unstable and shock-sensitive material (RCRA Permit).

2. The requirements of the facility waste analysis plan must be met (RCRA Permit).

3. Waste is not reactive, as defined in 40 CFR 261.23, or ignitable, as defined in 40 CFR 261.21 (RCRA Permit).

4. At the HEPA Filter Leaching System (HFLS):

    a. Only INTEC filters may be accepted for storage or treatment. (RCRA Permit)

    b. HEPA filters may not exceed 2 feet 11 inches × 2 feet 5 inches × 1 foot 4 inches (RCRA Permit)

    c. HEPA filters may not contain cellulose-based material (e.g., wood and paper) (RCRA Permit).

## 4.6 Low-Level Waste

### 4.6.1 General

The following acceptance criteria apply to all LLW to be stored or disposed at the INEEL or shipped to an offsite commercial facility for processing (compaction or sizing) or shipped offsite for disposal.

1. Documentation

    a. A completed IWTS M&WCP for each waste stream shall be approved by WGS in accordance with MCP-62, "Low-Level Waste Management."

    b. An IWTS shipment task profile shall be completed for each waste package before shipment.

    c. Nuclear material accountability requirements shall be implemented and documentation shall be provided, as required in DOE 474.1-1A and DOE M 474.1-2. DOE/NRC Form 741, "Nuclear Material Transaction Report." Nuclear accountability documents do not accompany waste shipments.

    d. Shipping papers (49 CFR 172.202, 203, 204).

e. Form 441.60, “INEEL Accountable Radioactive Source Registration or Transfer Form,” whenever a radioactive source is disposed (10 CFR 835.1202 and DOE G 441.1-13).

2. Prohibited Material

a. Pressurized containers or container configurations that can become pressurized during disposal. Containers must have been vented, drained, crushed, or otherwise reconfigured to prevent pressurization. (DOE O 435.1)

b. Radioactive materials in a gaseous form that have been packaged such that the pressure is greater than 1.5 atmospheres absolute at 20°C (DOE O 435.1.IV.G.(1).5).

c. PCBs >50 ppm (40 CFR 761), except for the following list of radiologically contaminated items.

(1) PCB bulk product waste (40 CFR 761.62) consisting of:

(a) Plastics

(b) Preformed or molded rubber parts and components

(c) Applied dried paints

(d) Varnishes, waxes or other similar coatings or sealants

(e) Caulking

(f) Galbestos

(g) Nonliquid building demolition waste.

(2) Other PCB bulk product waste, sampled in accordance with the protocols set out in Subpart R of 40 CFR 761 (start at 40 CFR 761.340) that leaches PCBs at <10 µg /L of water (40 CFR 761.62(b)).

(3) PCB cleanup waste (40 CFR 761.61(a)(5)(v)) consisting of non-liquid cleaning materials and personal protective equipment waste at any concentration, including nonporous surfaces and other nonliquid materials such as rags, gloves, booties, other disposable personal protective equipment, and similar materials resulting from cleanup activities.

d. Material capable of generating toxic gases, vapors, fumes, or liquids in harmful/toxic quantities (DOE O 435.1, Chapter IV.G. (1).4).

e. Pyrophoric materials, as defined in 49 CFR 173.124(b)(1): DOT Class 1 (Formerly Class A, D, and C explosive); or unstabilized shock-sensitive reactive, as determined by WGS (RWMC SAR).

f. Waste is not, and does not have the potential to be, forbidden material as defined in 49 CFR 173.21, or forbidden explosives as defined in 49 CFR 173.54.

3. Waste originating from high-level waste systems may have a Waste Incidental to Reprocessing (WIR) determination to classify them as a waste type other than high-level waste. Waste Acceptance Criteria for WIR wastes will be developed in accordance with the appropriate disposal site Waste Acceptance criteria.

4. Free liquid contained in solid low-level waste has been converted into a form that contains as little free standing liquid as is reasonably achievable, but in no case does the liquid exceed 1% of the waste volume when the low-level waste is in a disposal container, or 0.5% of the waste volume after it is processed to a stable form (DOE O 435.1).

### 4.6.2 Contact-Handled, Low-Level Waste to be Disposed at the Radioactive Waste Management Complex

In addition to meeting all of the criteria of Section 4.6.1, the following acceptance criteria must also be met before shipping contact-handled LLW to the RWMC for disposal:

1. Radiation levels are <500 mR/hr at 1 meter.

2. Waste exceeding any limits requires a case-by-case evaluation (performance assessment [PA]) prior to disposition as low-level waste (RWMC PA).

3. Radiologically contaminated PCB wastes may be disposed at the RWMC, based on the disposal exemption provided in 40 CFR 761.50(b)(7)(ii), which allows these waste types to be disposed without regard to their PCB properties as long as they are compliantly disposed in accordance to their radioactive properties. See Section 4.8 for further information.

4. Table 4.6.2-1 specifies: (a) the radionuclide waste volume concentration limits for each waste package destined for disposal at the RWMC, (b) the total radionuclide inventory limits for all LLW to be disposed of in the active LLW disposal pits at the RWMC, and (c) the IWTS lower reporting limits for each radionuclide. The values in the table should be applied as follows:

    a. Waste volume concentration limits (RWMC PA, Case et al. 2000, and EDF-2744) are to be applied to each waste container destined for disposal. Compliance is to be confirmed by demonstrating that the sum of the fractions for radionuclides in the container is <1. Note that it is not acceptable to dilute a small, highly concentrated waste form in a large container in order to meet the waste volume concentration limits.

Table 4.6.2. PA waste volume concentration and total inventory limits for LLW disposal.

| Radionuclide | Waste Concentration Limits[f] Vaults ($Ci/m^3$) Unless otherwise Noted | Waste Concentration Limits[f] Pits ($Ci/m^3$) Unless otherwise Noted | Total Inventory Limits (Ci) | Lower Reporting Limit[b] ($Ci/m^3$) Unless otherwise Noted |
|---|---|---|---|---|
| Am-241 | 8.7 nCi/g | 8.7 nCi/g | N/A | 0.1 nCi/g |
| Am-243 | — | 7.6 nCi/g | N/A | 0.1 nCi/g |
| C-14 | | | | |
| - general waste | N/A | N/A | 40[c] | 0.0008 |
| - activated metal | 2,400 | 2,400 | 5,200[c] | 0.008 |
| - beryllium | N/A | N/A | 200[c] | 0.008 |
| Cl-36 | — | 0.18 | 2.9 | 0.00018 |
| Cm-244 | 510 nCi/g | 510 nCi/g | N/A | 0.5 nCi/g |
| Co-60 | 70,000 | 35,000 | N/A | 7 |
| Cs-137 | 6.3 | 3.1 | N/A | 0.01 |
| Eu-152 | 4,200 | 4,200 | N/A | 42 |
| Eu-154 | 48,000 | 48,000 | N/A | 480 |
| H-3 (general waste) | 40[e] | 40[e] | 11,000[c] | 0.4 |
| - beryllium | N/A | N/A | 4.9E+08[c,d] | 4.0 |
| I-129 | N/A | N/A | 0.30 | 0.00008 |
| Na-22 | N/A | N/A | 55,000 | 0.1 |
| Nb-94 | 0.22 | 0.11 | N/A | 0.002 |
| Ni-59 | 1,800 | — | 200,000 | 0.18 |
| Ni-63 | 1,700 | 850 | N/A | 0.035 |
| Np-237 | 6.1 nCi/g | 6.1 nCi/g | 4.0 | 0.1 nCi/g |
| TRU (not listed elsewhere in this table) | 10 nCi/g | 10 nCi/g | N/A | 0.1 nCi/g |
| Pu-239 | 10 nCi/g | 7.7 nCi/g | N/A | 0.1 nCi/g |
| Pu-240 | 7.8 nCi/g | 7.8 nCi/g | N/A | 0.1 nCi/g |
| Pu-241 | 250 nCi/g | 250 nCi/g | N/A | 0.25 nCi/g |
| Pu-242 | 8.0 nCi/g | 8.0 nCi/g | N/A | 0.1 nCi/g |
| Ra-226 | 0.17 | 0.27 | N/A | 0.002 |
| Sr-90 | 41 | 4.8 | N/A | 0.0004 |
| Tc-99 | 16 | 8.2 | 110 | 0.0003 |
| Th-230 | 0.019 | 0.015 | 69 | 0.002 |
| Th-232 | 0.0035 | 0.0025 | 33 | 0.00025 |
| U-232 | — | 0.013 | N/A | 0.0001 |
| U-233 | 0.033 | 0.032 | 9.6 | 0.0003 |
| U-234 | 0.037 | 0.037 | 37 | 0.0004 |

Table 4.6.2. (continued).

| Radionuclide | Waste Concentration Limits[f] Vaults ($Ci/m^3$) Unless otherwise Noted | Waste Concentration Limits[f] Pits ($Ci/m^3$) Unless otherwise Noted | Total Inventory Limits (Ci) | Lower Reporting Limit[b] ($Ci/m^3$) Unless otherwise Noted |
|---|---|---|---|---|
| U-235 | 0.040 | 0.040 | 10 | 0.0004 |
| U-236 | 0.040 | 0.040 | 10 | 0.0004 |
| U-238 | 0.042 | 0.042 | 41 | 0.0004 |

N/A = bounded by other limit(s) in this table.

"—" = no activity forecasted, thus no limit calculated.

a. The waste concentration limits in this table are based on the site-specific performance assessment (Case et al. 2000) and supporting documentation (EDF-2744 and EDF-2803) that were prepared to demonstrate compliance with DOE O 435.1 requirements governing disposal of LLW. Based on site-specific considerations, the limits for some radionuclides in this table may be somewhat greater than the generic waste concentration limits identified by the NRC for commercial LLW disposal.

b. These values represent the concentrations in a given waste container above which the radionuclide concentration needs to be reported in IWTS.

c. The total inventory limits for C-14 and H-3 are based on the assumption that all C-14 and H-3 migrates down to the groundwater and there is no upward migration in the vapor phase. If necessary, more realistic modeling that includes the upward migration of C-14 and H-3 could result in increased total inventory limits for these radionuclides.

d. This category can also include other waste from or special waste containers that limit the release rate of tritium to levels equal to or less than the release rate from activated beryllium.

e. Per 10-CFR-61.

f. The concentration limits for waste in containers to be placed such that the height of any container will be greater than 6.1 m (20 ft) above the pit floor shall be a factor of 100 times less than the values in this table unless approved by Landfills and Waste Disposal Project Lead.

b. Total radionuclide inventory limits are to be tracked continually over the remaining lifetime of the active LLW disposal pits (including the concrete vaults) (RWMC PA, Case et al. 2000, and EDF-2803). This is a cumulative limit; thus, prior to disposal a check is performed through IWTS by WGS LLW personnel to confirm that the radionuclides in the container will not cause the total inventory limit for any radionuclide in Table 4.6.2-1 to be exceeded.

5. IWTS radionuclide reporting requirements per DOE O 435.1, Chapter IV.I, in addition to those discussed in Section 4.6.1, are necessary for disposal of waste at the RWMC. Radionuclide concentrations in a given waste container destined for disposal at the RWMC are reported in IWTS as follows:

   a. Report if the concentration is greater than the lower reporting limits identified in Table 4.6.2-1.

   b. Report if the concentration for a radionuclide not listed in Table 4.6.2-1, with a half-life less than 5 yr, is greater than 7 $\mu Ci/cm^3$.

   c. Report if the concentration for a radionuclide not listed in Table 4.6.2-1 comprises greater than 1% of the total activity in the waste package.

   d. Daughter products in secular equilibrium with the parent radionuclide are not reported. Report only the curie value of the parent radionuclide. For the purposes of this criterion, daughter products in secular equilibrium include only those radionuclides that have half-lives equal to or less than 10 days and equal to or less than their parent radionuclide.

e. These IWTS reporting requirements are not to be misconstrued as a definition of nonradioactive or unrestricted release limits.

6. Due to the significance of C-14 in the results of the RWMC PA and CA, in addition to the total inventory limit for disposal of C-14 identified in Table 4.6.2-1, the following annual guidelines are identified for the disposal of C-14 in the RWMC:

   a. 1.9 Ci per year total in waste forms other than activated metals

   b. 250 Ci per year total in activated metals.

   Disposal of waste that will cause these annual guidelines to be exceeded requires approval from the WGS LLW Project Manager and formal concurrence from the DOE-ID LLW program manager.

7. Scaling factors may be used to include radionuclides not normally submitted for analysis. Scaling factors should be developed on a facility and waste stream-specific basis and shall be initially determined and periodically confirmed through direct measurement. This includes isotopes occurring in decay chains of heavy radionuclides (EDF INEEL-2001-032).

8. Unirradiated reactor core components have been chemically analyzed for RCRA metals against their individual threshold limits. Component material impurities are analyzed to determine the nitrogen, carbon, niobium, nickel, and uranium concentrations down to 1 ppm. Resultant analytical values have been documented to support scaling factor development and waste determination and disposition decisions.

9. Absorbents and stabilizing agents used to eliminate free liquids, per DOE O 435.1, have undergone the generator's bench-scale testing. The testing must demonstrate that the absorbent or stabilizing agents eliminate free liquids from the waste as specified by the vendor or that an improved specific-use methodology has been developed (DOE O 435.1). An acceptable free liquid test that complies with SW-846 method 9095 is in Engineering Design File WGS 005, "Free Liquid Test Method for Low Level Waste Absorbed/Immobilized Liquids."

10. Wastes generated or packaged underwater are packaged in containers that are closed and do not leak (49 CFR 173.24, 173.412, 173.475).

11. Waste containing tritium has been packaged to prevent exceeding an equivalent package release rate of 49 $Ci/m^3/y$ (RWMC PA).

12. Wastes (soils, tanks, pumps, liquids, etc.) have been generated from non-CERCLA activities.

13. The void volume within the waste and between the waste and its packaging is reduced as much as practical (DOE O 435.1).

14. Low-level waste resulting from treating RCRA mixed waste (40 CFR 268)

   a. Does not exhibit characteristic hazards.

   b. Meets all applicable land disposal restriction (LDR) waste treatment standards.

c. Is documented appropriately, with necessary LDR notifications and certifications placed in the INEEL operating records, and is sent to the State of Idaho (one time notifications for each distinct waste stream).

15. Debris waste, treated in accordance with 40 CFR 268.45, may be disposed at the RWMC.

16. Fissile material concentrations do not exceed the threshold concentrations listed in the SAR.

17. Drums are placed on metal pallets (RWMC operations safety requirement).

18. Fire retardant paint used on waste boxes must be approved by the RWMC Fire Engineer.

19. Waste packages that comply with requirements of Table 4.6.2-2, may be used for shipment to RWMC without Packaging and Transportation organization approval. All other containers must be approved by Packaging and Transportation organization and RWMC operations.

### 4.6.3 Remote-Handled, Low-Level Waste to be Disposed of at the Radioactive Waste Management Complex

Waste with radiation readings >500 mR/hr at one meter that meets the criteria of Sections 4.6.1 and 4.6.2 may be disposed at RWMC, if packaging meets the below criteria.

1. Remote-handled waste container labels are permanently affixed and the container identification number is located on the container top is visible and is legible through remote visual verification equipment. (49 CFR 172 Subpart D) This number is directly traceable to an IWTS Container Profile.

2. The following standard containers may be used for shipment to RWMC without Packaging and Transportation approval. All other containers must be approved by the Packaging and Transportation organization.

    a. NRF 55 ton insert

    b. NRF 58.5 ton insert

    c. Test Rector Area (TRA) resin system

    d. Mark III DOT 7A Concrete Box

    e. HFEF-5 Waste Canister

    f. ANL-W 55-gallon crimp head drum

    g. Naval Reactor Facility (NRF) and TRA concrete vaults

    h. NRF-A1W sealed resin columns waste package

    i. NRF expended core facility water pit demineralizer, Type V tank assembly

    j. Remote Analytical Laboratory (RAL) 30-gallon insert

    k. 6M Shipping Packages (Specification ES-51526).

Table 4.6.3. Approved standard containers for contact-handled, LLW at the RWMC.

| Characteristic | DOT Steel Drums | Criterion Basis | INEEL Wooden Boxes[a] (SPC-1512) | Criterion Basis |
|---|---|---|---|---|
| Gross Weight | Allowable net weight of contents is established by the drum manufacturer by performance testing | 49 CFR 178 | 12,800 lb | SPC-1512 |
| Dimension | 5 gal. to 100 Gal. | 49 CFR 178 | 4 ft × 4 ft × 4 ft<br>2 ft × 4 ft × 8 ft<br>4 ft × 4 ft × 8 ft<br>(Soils prohibited)[b] | Spc-1512 |
| Liner (minimum)[c] | Optional | | 3 Ply Reinforced plastic[c,d] | |
| Lid gasket[d] | Specified by drum manufacturer | 49 CFR 178 | | Drawing 41026 |

| Characteristic | ST-90 Metal Boxes | Criterion Basis | BR-90 Metal Boxes | Criterion Basis |
|---|---|---|---|---|
| Gross Weight | 10,000 lb net payload | Manufacturer Specification | 10,000 lb net payload | Manufacturer Specification |
| Dimension | 75 in. long × 49 in. wide × 50 3/16 in. high | | | |
| Liner (minimum)[c] | N/A | | | |
| Lid gasket[d] | Neoprene | | N/A | |

Table 4.6.3. (continued).

| Characteristic | DOT Specification 7A Type A 71 Gallon Square Drums | Criterion Basis | B-25 400 Metal Bins | Criterion Basis |
|---|---|---|---|---|
| Gross Weight | 1,350 lb | DOE/RL-96-57 | 10,000 lb net payload | Manufacturer Specification |
| Dimension | 34.75 or 34.88 in. high × 23.50 in. wide | DOE/RL-96-57 | 72 1/2 in. long × 51 1/2 in. high × 46 3/4 in. wide | |
| Liner (minimum)[c] | | | | |
| Lid gasket[d] | Neoprene gasket | DOE/RL-96-57 | Neoprene or Buna-N | |

| Characteristic | DOT Specification 7A Type A Steel Drums | Criterion Basis | DOT Specification 6M Drum | Criterion Basis |
|---|---|---|---|---|
| Gross Weight | Allowable net weight of contents is established by performance testing and is specified in the test report required by 49 CFR 173.415(a) | 49 CFR 173.415 | As specified in 49 CFR 178.354 | |
| Dimension | 5 Gallon to 85 Gallon | | 10 Gallon to 110 Gallon | 49 CFR 178.354 |
| Liner (minimum)[c] | Specified by drum manufacturer | 49 CFR 173.415 | | |
| Lid gasket[d] | Specified by drum manufacturer | 49 CFR 173.415 | | |

Table 4.6.3. (continued).

| | Mark III DOT Spec 7A Type A Concrete Box | Criterion Basis | Soft-side Containers (Transport Plastics Lift-Liner) | Criterion Basis |
|---|---|---|---|---|
| Gross Weight | 12,000 lb net payload | DOE/RL-96-57 | 23,000 lb | SPC-181 |
| Dimension | 96 in. long × 48 in. wide × 48 in. high | | 8 ft × 7 ft × 4 ft | |
| Liner (minimum)[c] | Ultra-Lock 33-5 (polyethylene) | DOE/RL-96-57 | Plastic per SPC-181 | |
| Lid gasket[d] | ASTRD-Foam, Material Code #350-48 | DOE/RL-96-57 | N/A | |

| Characteristic | ANL M-4 Steel Bin | Criterion Basis | ANL Shade (Shielded Hot Air Drum Evaporator) | Criterion Basis |
|---|---|---|---|---|
| Gross Weight | 3,000 lb | DOE/RL-96-57 | 8,000 lb | |
| Dimension | 72.375 in. high × 58.375 in. wide × 50.375 in. long | DOE/RL-96-57 | 3 ft diameter × 5 ft high | |
| Liner (minimum)[c] | N/A | | N/A | |
| Lid gasket[d] | Neoprene | | N/A | |

a. Maximum-loaded gross weight, uniformly distributed, for the INEEL wooden boxes is 12,800 lb (SPC-1512). These boxes are banded with 3/4-in.-steel banding material. As a minimum, five bands are used. Three horizontal bands are used (RWMC drawings 410206 and 410205) and during closure two vertical bands are applied, one-third the length of the box from each end.

b. LLW soils are disposed of in 64 ft 3-ft boxes or soft-sided waste packaging, unless the soil has been immobilized, in smaller packages or when used as a filler to achieve volumetric efficiency. Contact WGS when packaging soil.

c. Wrapping of individual waste items in one 8-mil yellow polyethylene is an equivalent liner. A damaged liner shall be repaired or replaced. Liner is a 3-ply linear low density polyethylene copolymer and nylon yarn laminate. (ES-50338, ES-50339, ES-50340).

d. The lid is secured using 8-penny, cement-coated nails, 1-1/2-in. staples, or 1-1/2-in. grabber screws on 12-in. centers.

### 4.6.4 Low-Level Waste to DOE-Owned Disposal Facilities

INEEL generators may send waste to offsite DOE-owned facilities. If offsite DOE-owned facilities are used, the Waste Acceptance Criteria of the facility must be met. Contact WGS for assistance.

### 4.6.5 Low-Level Waste to Private Sector Facilities

INEEL generators may send waste to private sector subcontracted facilities. If private sector facilities are used, the Waste Acceptance Criteria of the facility must be met.

## 4.7 Mixed Low-Level Waste

### 4.7.1 General

New waste streams for which a material profile does not exist at the time of generation are assigned to Site Treatment Plan identification number IDINEL1YR. All newly generated MLLW must be treated within one year of generation. If it cannot be treated within one year, it must be added to the Site Treatment Plan with DOE concurrence (40 CFR 268.50).

The following acceptance criteria apply to all mixed low-level waste (MLLW) shipped to INEEL Facilities.

1. Waste acceptance is subject to capacity and operational limitations of the receiving facility.

2. The applicable Waste Acceptance Criteria listed in Sections 4.5 Hazardous Waste and 4.6 Low-Level Waste, shall be met.

3. Addition of the waste to an INEEL TSD does not result in exceeding the facility's SAR limits for chemical or radiological constituents.

4. Waste originating from high-level waste systems may have a Waste Incidental to Reprocessing (WIR) determination to classify them as a waste type other than high-level waste. Waste Acceptance Criteria for WIR wastes will be developed in accordance with the appropriate disposal site Waste Acceptance Criteria and PLN-1036, "Waste Incidental to Reprocessing Determination Activities."

### 4.7.2 Mixed Low-Level Waste to Private Sector Treatment, Storage, or Disposal Facilities

Meet the criteria of Section 4.7.1 and the Waste Acceptance Criteria of the private sector TSD.

### 4.7.3 Mixed Low-Level Waste to be Stored at Radioactive Mixed Waste Staging Facility (RMWSF CPP-1617)

In addition to meeting all the criteria in Section 4.7.1, the following acceptance criteria must also be met before shipping and receiving at RMWSF (CPP-1617).

1. Due to outdoor storage concerns, wooden boxes are not received at CPP-1617 without justification and approval from the facility manager.

2. Waste is limited to less than 15 grams of fissile material per container that is greater than 15 L and less than one gram of fissile material per container that is 15 L or less. In certain cases, containers greater than 200 L may contain up to 300 grams of fissile material. Containers that exceed 15 grams per container are reviewed separately for fissile material content and are stored in groups that collectively contain less than 300 grams of fissile material (CPP-1617 SAR INEEL/EXT-97-01231).

3. Standard DOT-approved containers defined in 49 CFR 173 are used to contain waste.

4. Solid and liquid wastes are packaged in separate containers (49 CFR 173).

### 4.7.4 MLLW to be Stored and Treated at Liquid Effluent Treatment and Disposal and Nitric Acid Recycle Tanks (LET&D CPP-1618)

The LET&D Facility at INTEC is operated as a part of the larger INTEC Liquid Waste Management System (ILWMS). It receives only overhead condensate from the Process Equipment Waste Evaporator (PEWE). All liquid wastes received from anywhere not permanently plumbed into the ILWMS are introduced via the PEWE feed collection tanks. The LET&D facility provides partial treatment of PEWE overheads by concentrating liquid and by removing the water from the solution by vaporization. The acid fraction from the LET&D process must be stored for final treatment at other facilities.

WGS assists generators in conducting waste characterization of waste proposed for treatment in the PEW system. INTEC Operations reviews these data against established PEW WAC and has final approval for wastes being accepted into the PEW system for treatment. The Waste Acceptance Criteria for the LET&D are established in PRD-166, "INTEC PEW Chemical Acceptance Criteria."

### 4.7.5 Mixed Low-Level Debris to be Treated at CPP-659 or Stored at CPP-659, CPP-1659, and CPP-666

In addition to meeting all the criteria of Section 4.7.1, the following acceptance criteria must also be met for mixed waste to be debris treated at CPP-659 or stored at CPP-659, CPP-1659, and CPP-666:

1. Waste does not contain:

    a. Free liquids or liquid-bearing wastes (RCRA Permit)

    b. PCB-contaminated debris at concentrations >2 ppm (RCRA Permit)

    c. (HEPA Filter Leach System (HFLS) only) HEPA filters exceeding 2 feet 11 inches × 2 feet 5 inches × 1 foot 4 inches (RCRA Permit)

    d. (HFLS) HEPA filters containing cellulose-based material (e.g., wood and paper) (RCRA Permit)

    e. Items that do not meet the definition of "debris" as defined in 40 CFR 268.2 (g) (excluding solid residuals from treatment) (RCRA Permit)

    f. Items that will generate liquid treatment residuals that do not comply with the requirements of downstream TSDFs or have an identified path to disposal (RCRA Permit)

g. Wastes that do not comply with 40 CFR 268.3 “dilution prohibition” (RCRA Permit)

h. Unstable and shock-sensitive material (RCRA Permit).

2. When applicable, wastes must meet the requirements of the facility waste analysis plan (RCRA Permit).

3. Only INTEC filters may be accepted for storage or treatment in these units (RCRA Permit).

4. Prior to acceptance into the facility, the generator must certify that filters contain less than 15 grams of U-235 or equivalent (ORM 6.5.1.3).

5. Standard containers for packaging debris waste for treatment are any of the following:

   a. DOT-authorized drums, as follows:

      (1) 55-gallon drum

      (2) 30-gallon drum

      (3) 71-gallon square drum

   b. 6M Shipping Packages (ES-51526)

   c. Argonne National Laboratory East (ANL-E), DOT 7A Steel Bin

   d. INEEL wooden boxes

   e. Metal container meeting Department of Transportation (DOT) strong tight container (STC) and industrial packaging, Type IP-1, requirements; i.e., B-25 or BR90 Metal Container

   f. M-III Bin

   g. DOT 7A Type A steel Boxes

   h. “Soft-Sided” containers manufactured by “Transport Plastics”

   i. Other containers may be accepted on a case-by-case basis.

## 4.8 Polychlorinated Biphenyl Waste

### 4.8.1 General

Wastes and materials containing polychlorinated biphenyls (PCBs) at concentrations or derived from processes regulated by TSCA may be stored at INEEL TSDFs, in some cases disposed of in the RWMC, and may be shipped to offsite commercial facilities for treatment and disposal. In many instances, wastes contaminated with PCBs are also subject to other Waste Acceptance Criteria, such as for hazardous, mixed, or radioactive wastes. In these instances, the applicable WAC for each regulated constituent must be addressed. There are also several exemptions applicable to storage and disposal of multiple waste types.

The following acceptance criteria apply to all PCB waste generated at the INEEL:

1. The hazardous Waste Acceptance Criteria listed in Sections 4.5.1 must be met, and if radioactively contaminated, the criteria of Section 4.6.1 and 4.7.1 must be met.

2. For PCB waste that is not radiologically contaminated, INEEL Form 435.02, "No Radioactivity Added Certification" (J. T. Case letter to J. A. VanVliet OPE/WMPO-95-267).

3. Waste packages for nonradioactive PCB wastes are packaged to meet the following criteria:

    a. Liquid PCB wastes must be packaged in accordance with the specifications defined in 49 CFR 173.212 and 173.213.

    b. Nonliquid PCB wastes must be packaged in accordance with the specifications defined in 49 CFR 173.212 and 173.213.

    c. Due to the PCB Anti-Dilution Rule, EPA requires wastes containing <20 ppm PCBs or <1 lb of PCBs (regardless of concentration) to be packaged in accordance with DOT HMR Packing Group Type III as a minimum. Type I or II packaging must be used for these wastes if other hazards present in the waste require a more stringent Packing Group.

4. PCB/radioactive wastes are packaged to meet the following criteria:

    a. The waste is packaged in accordance with the criteria for nonradioactive PCB waste.

    b. Alternatively, PCB/radioactive wastes may be stored in a container that does not meet the DOT requirements defined in 3.a and 3.b of this section, as long as:

        (1) Containers with liquid PCB/radioactive wastes are nonleaking.

        (2) Containers with nonliquid PCB/radioactive wastes are designed to prevent buildup of free liquids if the containers are stored in a secondary containment berm where liquids may accumulate.

        (3) Liquid and nonliquid PCB/radioactive wastes are packaged in containers that meet nuclear critical safety. Acceptable containers include polyethylene and stainless steel. Other container types may be used if demonstration can be made to the EPA regional administrator and other appropriate agencies (DOE, NRC, etc.) that use of other containers is protective of human health and the environment, and public health and safety.

        (4) Liquid PCB/radioactive wastes may be stored in the following old specification DOT containers, with standards in effect on September 30, 1991:

            (a) Specification 5 container without removable head

            (b) Specification 5Bcontainer without removable head

            (c) Specification 6D overpack with specification 2S and 2SL polyethylene containers

            (d) Specification 17E container

(5) Nonliquid PCB radioactive wastes may be stored in the following old specification DOT containers, with standards in effect on September 30, 1991:

(a) Specification 5B container

(b) Specification 17C container.

5. The use of stationary storage containers with capacities greater than those specified in the DOT requirements for liquid PCBs may only be used after first receiving approval from WGS.

6. Marking and labeling for each waste package include a PCB Mark $M_L$ or Mark $M_S$, indicating the INEEL as generator and PCB out of service date(s) (40 CFR 761.40 and 40 CFR 761.45).

### 4.8.2 PCB/Radioactive Waste to be Disposed of at the RWMC

Certain PCB/radioactive wastes may be disposed of in LLW disposal facilities operated in compliance with applicable radioactive waste disposal regulations without regard to the PCB concentration in the waste. The acceptable wastes are based on the source of generation and the waste form. The criteria for these wastes are as follows.

1. PCB Bulk Product Waste (40 CFR 761.62(b)(1)(i))

   a. Must be derived from manufactured products containing nonliquid PCBs

   b. Does not include

      (1) PCB items

      (2) PCB remediation waste

      (3) PCB household waste

   c. Examples of PCB Bulk Product Waste include (but are not limited to)

      (1) Fluorescent light ballast containing PCBs in the potting material only. Care must be taken to ensure the capacitor in the light ballast is PCB free.

      (2) Plastics, applied dried paints, sealants, caulking, insulation

      (3) Non liquid bulk waste or debris from building demolition that contains PCBs.

   d. Excluded from the definition of bulk product waste is demolition debris contaminated with spills of PCBs that had not been cleaned up

2. Dewatered Bulk PCB Remediation Waste <50 ppm (40 CFR 761.61(a)(5)(i)(B)(2)(ii)). This waste may include (but is not limited to) the following non-liquid items contaminated with <50 ppm PCBs:

   a. Soil

   b. Sediments

c. Dredged materials

d. Sewage sludge

e. Industrial sludge.

3. Nonliquid cleaning materials and personal protective equipment from self-implementing remediation site cleanups and from decontamination activities, including items such as brushes, gloves, coveralls, and rags (40 CFR 761.61(a)(5)(v)(A), (40 CFR 761.79(g)(6))

4. Drained carcasses of PCB-contaminated electrical equipment (40 CFR 761.60(b)(4)(i)(A), 40 CFR 761.60(b)(6)(ii)(B)). This waste includes items such as transformers and voltage regulators.

5. Nonliquid wastes from research and development activities, including glassware, tubing, and filter paper (40 CFR 761.64(b)(2)).

### 4.8.3 PCB Waste to Private Sector Facilities

PCB wastes not suitable for disposal at the RWMC will be managed at an offsite facility. PCB wastes must be shipped to an appropriate offsite facility that can compliantly manage the waste based on the waste type and PCB concentration.

Depending on the type of waste and the PCB concentration, necessary waste management facilities include TSCA-permitted incinerators; high-efficiency boilers, chemical waste landfills, or Part B permitted TSDs. In addition, several waste types (such as those described above for the RWMC) may be disposed of in a nonmunicipal/nonhazardous or municipal waste landfill operated in accordance with 40 CFR 257 or 258, respectively (or equivalent state regulations).

WGS manages the contracts for offsite facilities managing INEEL PCB waste. Generators obtain the assistance of WGS to ensure acceptance criteria are met in order to ship waste to such facilities. Acceptance criteria information specific to such facilities under contract for the INEEL are available from WGS. All requirements specified in Section 4.8.1 must also be met.

## 4.9 Radioactive/Hazardous Aqueous Waste

### 4.9.1 General

Certain aqueous waste may be discharged to the INTEC Liquid Waste Management System (ILWMS) for volume reduction.

### 4.9.2 Radioactive/Hazardous Liquid Waste at INTEC

All aqueous waste discharged to the ILWMS must satisfy the criteria specified in PRD-166.

## 4.10 Transuranic Waste

The following acceptance criteria apply to all transuranic (TRU) waste to be stored at the Radioactive Waste Management Complex (RWMC). The criteria are arranged according to the type of requirement. General requirements are listed first, followed by documentation-related requirements, packaging requirements, waste content requirements, and transportation requirements.

The acceptance criteria described in this chapter is applicable to the TRU waste to be accepted for storage at RWMC on or before December 31, 2002. RWMC will not accept any newly generated CH TRU waste after December 31, 2002. Storage and future disposition of newly-generated CH-TRU waste after December 31, 2002, will require negotiation with DOE-ID and the Advanced Mixed Waste Treatment Project.

### 4.10.1 General Requirements

1. Owing to the detail of the WIPP WAC final requirements and the restrictive criteria of the TRU transportation requirements, the TRU waste generator interface (GI) must be contacted before TRU waste is generated or packaged.

2. A waste certification program plan must be submitted to the TRU waste GI for approval by each facility requesting to ship waste to the RWMC. This plan must be approved by the GI prior to initiation of the first shipment and must be updated annually.

3. Offsite, non-INEEL waste generators must be authorized by the Department of Energy Idaho Operations Office (DOE-ID) before sending TRU waste to the RWMC for storage.

4. TRU waste with no identified path to disposal is generated only in accordance with DOE Order 435.1, Chapter III, H.(2), and is managed on a case-by-case basis.

5. TRU waste data have been completed for each waste payload container before shipment (RCRA Permit).

6. The TRU alpha activity concentration of the waste must be >100 nCi/g of alpha-emitting TRU isotopes with half-lives greater than 20 years, exclusive of the rigid liner and any added shielding (WIPP WAC).

7. Radiation levels of waste packages are verified by the RWMC receiving organization to agree with those reported by the waste generator at the time of shipment to within the following amounts:

    a. ±100% for reported levels <10 mR/hr

    b. ±20% for reported levels ≥10 mR/hr.

8. The generator must document the program from which the waste originates for the purpose of determining if the waste is defense related. Applicable defense-related programs are (WIPP WAC):

    a. Naval reactors development

    b. Weapons activities, including defense inertial confinement fusion

    c. Verification and control technology

    d. Defense nuclear materials production

    e. Defense nuclear waste and materials by-products management

    f. Defense nuclear materials security and safeguards and security investigations

    g. Defense research and development.

9. Generators of asbestos-containing TRU must contact the RWMC and TRU waste program for guidance before shipping the waste to the RWMC.

10. Waste originating from high-level waste systems may have a Waste Incidental to Reprocessing (WIR) determination to classify them as a waste type other than high-level waste. Waste Acceptance Criteria for WIR wastes will be developed in accordance with the appropriate disposal site Waste Acceptance Criteria and PLN-1036, "Waste Incidental to Reprocessing Determination Activities."

### 4.10.2 Documentation Requirements

1. Nuclear material accountability requirements are implemented and documentation is provided, as required in DOE M 474.1-1A and DOE M 474.1-2. DOE/NRC Form 741, "Nuclear Material Transaction Report," is provided as required by the cited requirements documents. Nuclear accountability documents do not accompany waste shipments.

2. A completed INEEL Waste Tracking System (IWTS) Material and Waste Characterization Profile (M&WCP) has been approved by RWMC (RCRA Permit).

3. The following documentation accompanies each shipment:

    a. An approved IWTS Container Profile and Shipment Task Profile (for electronic submittal) or Shipment Request and Certification Report (for hardcopy submittal).

    b. Properly completed shipping papers.

    c. An approved WIPP Waste Stream Profile Form (WIPP WAC).

### 4.10.3 Packaging Requirements

1. The following packaging and labeling requirements must be met in addition to the requirements of Section 4.4.

    a. Dry-loaded waste payload containers, such as drums, boxes, or inserts with potential for free liquids have an absorbent or stabilizing agent used to ensure immobilization of free liquid because free liquids are not accepted. (RCRA Permit)

2. Absorbents and stabilizing agents used to eliminate free liquids have undergone the generator's bench-scale testing to demonstrate:

    a. That performance is as specified by the vendor or that an approved specific use methodology has been developed.

    b. Liquids do not separate from the absorbents or stabilizing agents due to ambient temperature cycles ranging from –50 to 110º F (Engineering Design File WGS-005).

3. The waste is packaged in one of the following standard containers (WIPP WAC, TRAMPAC):

    a. Department of Transportation (DOT) Type A 55-gal Drum.

    b. TRUPACT-II Standard Waste Box (SWB).

4. Internal waste container void volume, excluding the annulus between any overpack and the original container, should not exceed 15% (RCRA Permit).

5. Each waste container is vented to allow the release of hydrogen gas according to the following requirements (WIPP WAC, TRAMPAC, RCRA Permit):

    a. Each container must have one or more filter vents (WIPP WAC).

    b. Container filter vents must meet TRAMPAC specifications (TRAMPAC).

    c. Container rigid liner, if present, has a 0.3-in. vent hole or is filtered (TRAMPAC).

    d. Container vent installation date and model number of each filter element is recorded and is used to determine the aspiration period to demonstrate compliance with aspiration time requirements (WIPP WAC).

6. Payload containers must pass 49 CFR 173.412 design requirements and 49 CFR 173.475 control requirements (RCRA Permit).

7. Marking requirements for payload containers include the following:

    a. Marking as either defense or nondefense waste.

    b. Shipper's unique container identification number, which may be either:

        (1) A marking (i.e., ZYXW-99-0001) in which the first four characters identify the facility, the second two digits identify the current calendar year, and the last four digits are the container number (a new sequence of container numbers, commencing with 0001, is initiated each January 1).

        (2) A barcode issued by WGS.

8. Waste packages must comply with the requirements of Table 4.10.3-1.

Table 4.10.3-1. Contact-handled TRU waste containers to be stored at the RWMC

| Characteristic | DOT Type A 55-gal Drum | TRUPACT-II SWB | Criterion Basis |
|---|---|---|---|
| Gross weight | ≤1,000 | ≤4,000 | WIPP WAC |
| Dimension | 35 in. high × 24 in. dia. | 37 in. high × 71 in. long × 54 in. wide | TRUPACT-II SARP |
| Surface radiation (contact) | ≤200 mrem/hr | ≤200 mrem/hr | WIPP WAC |
| Fissionable material[a] | ≤Table 4.10.4-1 limits and ≤200 FGE | ≤Table 4.10.4-1 limits and ≤325 FGE | RWMC SAR and WIPP WAC |
| Decay heat | Varies | Varies | WIPP WAC, TRAMPAC |
| Liner | 90-mil rigid polyethylene[b] | N/A | |
| Tamper indicating device (TID)[c] | Yes | Yes | RCRA Permit |

Table 4.10.3-1. (continued).

| Characteristic | DOT Type A 55-gal Drum | TRUPACT-II SWB | Criterion Basis |
|---|---|---|---|
| Lid gasket | Gasket coated with Permate No. 2 nonhardening adhesive or equivalent | Neoprene (TRUPACT-II SARP) | As indicated |

a. Fissionable material limits are based on assumed low-density waste contaminated with small amounts of volumetric averaged fissionable material. Low-density waste is waste consisting of materials such as paper, polyethylene wrap, tape, glass, rags, blotting paper, scrap metal, and piping. Volumetric average is defined as concentration of fissionable material obtained by dividing the total fissionable material content of a container by its volume. The fissionable material limit is the limit listed in the table minus twice the absolute value of the error for the measuring equipment used.

b. A rigid polyethylene liner, as defined by procurement specification ES-50357, is used inside each UN 1A2 drum.

c. A TID is installed on each container by the waste generator.

### 4.10.4 Waste Contents Requirements

1. The following items are prohibited from the waste:

   a. Materials capable of generating toxic quantities of gases, vapors, or fumes (RCRA Permit).

   b. Chelating or complexing agents, except as residue material (RCRA Permit).

   c. Etiologic agents (RCRA Permit, 32 CFR 627.32 and 627.34).

   d. Pressurized containers that are not vented, drained, crushed, or otherwise configured to allow verification using radiography or other means that the container is no longer pressurized (WIPP WAC, TRAMPAC, RCRA Permit).

   e. Classified waste materials (RCRA Permit).

   f. Residual liquid in excess of 1% of the volume of the outer container or greater than 1 in. in any internal container (WIPP WAC, TRAMPAC).

   g. Polychlorinated biphenyls (WIPP WAC, RCRA Permit).

   h. Sealed containers greater than 4L, unless the container has been punctured or is fitted with a filtered vent (TRAMPAC, WIPP WAC).

   i. Radioactive pyrophorics >1% of the waste weight (WIPP WAC, TRAMPAC, RCRA Permit).

   j. Nonradioactive pyrophorics (WIPP WAC, TRAMPAC, RCRA Permit).

   k. Corrosives (RCRA Permit, WIPP WAC, TRAMPAC).

   l. Explosives (WIPP WAC, TRAMPAC).

   m. Spent nuclear fuel (RCRA Permit, WIPP WAC)

   n. High-level waste (RCRA Permit, WIPP WAC).

2. The total concentration of potentially flammable volatile organic compounds is <500 ppm in the headspace of the payload container (WIPP WAC, TRAMPAC).

3. Isotopes are detected and quantified with respect to analysis methods and system limitations, based on the WIPP WAC (Appendix A) and TRAMPAC.

4. The activity of each of the following radionuclides must be reported: Am-241, Pu-238, Pu-239, Pu-240, Pu-242, U-233, U-234, U-238, Sr-90, and Cs-137 (WIPP WAC).

5. Tritium waste has been prepared for storage to avoid exceeding an equivalent package release rate of 40 Ci/m3/yr (RCRA Permit).

6. Wastes are compatible with each other and with the packaging materials (WIPP WAC, TRAMPAC, RCRA Permit, 49 CFR 173.24(e) and 177.848, 40 CFR 264.17). Waste compatibility may be determined in part by comparing the TRUPACT-II chemical lists in the TRAMPAC.

7. The Pu-239 equivalent activity (PE-Ci) of the payload container is calculated in accordance with Appendix B of the WIPP WAC and is (WIPP WAC):

    a. ≤80 PE-Ci per 55-gallon drum.

    b. ≤1,100 PE-Ci per 55-gallon overpacked drum.

    c. ≤1,800 PE-Ci per 55-gallon drum containing a pipe component or solidified/vitrified waste.

    d. ≤130 PE-Ci per SWB containing untreated waste.

    e. ≤1,100 PE-Ci per overpacked SWB.

    f. ≤130 PE-Ci per TDOP containing directly loaded untreated waste.

8. Gas generation is limited in the payload container:

    a. The number of layers of plastic containment are known (TRAMPAC, RCRA Permit).

    b. Bags are closed using the twist-and-tape or fold-and-tape methods, or are filtered (TRUPACT-II SARP).

    c. Total decay heat plus error is calculated and recorded in the data package for each payload container (WIPP WAC, TRAMPAC, RCRA Permit).

9. Pu-239 fissile gram equivalent (FGE) is calculated in accordance with Section 3.1 of the TRAMPAC, complies with the limits in Table 4.10.4-1, and the FGE plus two times the error is (TRAMPAC):

    a. <200 grams per 55-gal drum

    b. <200 grams for a pipe overpack

    c. <325 g for an SWB

d. <325 g for a TDOP.

10. FGE procedures and calculations are performed as a function of Payload Compliance Planning.

Table 4.10.4-1. TRU waste fissile material concentration limits (RWMC SAR).

| Waste Matrix Group | | Polyethylene | Cellulose | Metal (Al)[a] | Concrete | Brick | Glass/Slag | Graphite | Salt |
|---|---|---|---|---|---|---|---|---|---|
| TVC[b,c] Pu-239 | g/lb | 3.10 | 1.30 | 0.82 | 0.38 | 0.23 | 0.09 | 0.02 | 5.53 |
| Pu-239 | g/kg | 6.82 | 2.86 | 1.8 | 0.84 | 0.51 | 0.20 | 0.04 | 12.17 |
| U-233 | g/lb | 4.98 | 2.16 | 0.38 | 0.62 | 0.34 | 0.15 | 0.03 | 4.27 |
| U-233 | g/kg | 11.0 | 4.75 | 0.84 | 1.36 | 0.75 | 0.33 | 0.07 | 9.39 |

a. To be conservative, the threshold value for metal is calculated using aluminum.
b. Threshold value concentration.
c. For all fissile radioisotopes except U-233.

### 4.10.5 Transportation Requirements

1. Removable surface contamination on each waste payload container does not exceed 200-dpm/100 $cm^2$ beta-gamma and 20-dpm/100 $cm^2$ alpha (WIPP WAC, RCRA Permit, 49 CFR 173.443).

2. External radiation dose rates of individual payload containers are ≤200 mrem/hr at the surface and ≤10 mrem/hr at 2 m from the payload container (WIPP WAC, TRAMPAC).

3. Radiation levels defined in these criteria are verified by the generator with calibrated radiation survey instruments (RCRA Permit).

### 4.10.6 Additional Requirements for Remote-Handled TRU Waste

In addition to meeting the requirements in Sections 4.10.1 to 4.10.5, with the exception of the surface radiation dose rate limit, the following acceptance criteria must also be met before shipping remote-handled (RH) TRU waste to the RWMC for storage.

1. RH waste must comply with the safety analysis report for the RH-72B waste shipping package and to the following criteria before acceptance at the TRU Storage Facility (DOE-ID Memorandum, May 19, 1987).

2. The waste is packaged in any of the following standard containers (WIPP WAC):

   a. DOT Type A, 55-gal Drum

   b. DOT Type A, 30-gal Drum

   c. RH 72B waste canister.

3. The container identification number on a RH waste container must be:

a. Permanently attached to the container top.

b. Visible and legible to remote, visible verification equipment.

c. Directly traceable to waste package content documentation (RCRA Permit).

4. The RH waste payload container and any sealed secondary container greater than 4 liters in size overpacked in payload containers must have one or more filter vents. Filter vents are optional on metal secondary containers containing solid inorganic waste only. The RH waste containers shall comply with the requirements listed in Table 4.10.6-1. (DOE 435.1, RH-TRU 72-B SAR)

## 4.11 Mixed Transuranic Waste

In addition to the acceptance criteria presented in Section 4.10, the following additional acceptance criteria apply to all mixed transuranic (TRU) waste to be stored at the Radioactive Waste Management Complex (RWMC). The criteria are arranged according to the type of requirement. General requirements are listed first, followed by documentation-related requirements, packaging requirements, waste content requirements, and transportation requirements.

### 4.11.1 General

1. An onsite evaluation of the generator's facility, waste operations, and documentation will be conducted by the receiving organization after receipt of the new INEEL Waste Tracking System (IWTS) Material and Waste Characterization Profile and for waste streams requiring re-approval (RCRA Permit, DOE Order 435.1).

2. For waste originating from a high-level waste system, a completed waste incidental to reprocessing determination.

Table 4.10.6-1. Remote-handled TRU waste containers to be stored at the RWMC.

| Characteristic | DOT Type A 55-gal Drum | DOT Type A 30-gal Drum | RH 72B Waste Canister | Criterion Basis |
|---|---|---|---|---|
| Gross weight | ≤800 lb | ≤400 lb[a] | ≤5,250 lb when direct loaded or ≤5,950 lb when loaded in using 3-55 gallon or 3-30 gallon drums | Design |
| Dimension | 35 in. high × 24 in. dia. | 29.5 in. high × 20 in. dia. | 121 inches high × 26 inches diameter | Design |
| Surface dose rate | >200 mrem/hr ≤30 R/hr | >200 mrem/hr ≤30 R/hr[b] | >200 mrem/hr ≤1,000 R/hr | DOE Order 435.1<br>Design |
| TRU content | ≤23 Ci/L | ≤23 Ci/L | ≤23 Ci/L | RH-TRU 72-B SAR |
| Fissionable material[d] | ≤ Table 4.9.4-1 limits and ≤200 g/drum | ≤ Table 4.9.4-1 limits and ≤100 g/drum | Must not exceed mass limits of 10 CFR 71.53 (≤325 FGE) | RWMC SAR and DOE Order 435.1 |
| Thermal power[e] | ≤50W | ≤50W | ≤50W | RH-TRU 72-B SAR |
| Inner container | N/A | Sealed metal or poly containers[f] | DOT type A 55-gallon or 30-gallon drum. | |
| Liner | 90-mil rigid poly[g] | Poly blow molded[h] | N/A | Design |

| Characteristic | DOT Type A 55-gal Drum | DOT Type A 30-gal Drum | RH 72B Waste Canister | Criterion Basis |
|---|---|---|---|---|
| TID | Yes[i] | Yes[i] | Seal weld. | RCRA Permit and RH-TRU 72-B SAR |

a. Handling limitation at the RWMC.
b. Upper radiation limit based on INEEL free-air transfer safety considerations.
d. Fissionable material limits are based on assumed low-density waste contaminated with small amounts of volumetric averaged fissionable material. Low-density waste is waste consisting of materials such as paper, polyethylene wrap, tape, glass, rags, blotting paper, scrap metal, and piping. Volumetric average is defined as concentrations obtained by dividing the total fissionable material content of a container by its volume. The fissionable material limit is the limit listed in the table minus twice the absolute value of the error for the measuring equipment used.
e. The thermal power generated by waste materials in any RH TRU waste package shall not exceed 300 watts. The thermal power is recorded in the data package.
f. Watertight sealed metal (26-guage minimum wall thickness) or polyethylene containers (0.105-in. minimum thickness) enclosed in a twist-and-tape, fold-and-tape closed, or heat sealed and vented, 0.020-in. thick polyvinyl chloride (PVC) sleeve.
g. A rigid polyethylene liner, as defined by procurement specification ES-50357, is used inside the UN 1A2 drum.
h. Puncture-proof liner (0.100-in. minimum wall, blow-molded polyethylene with 0.06-in. thick minimum, plain disc cover), enclosed in a twist-and-tape or fold-and-tape closed, 0.020-in. thick PVC liner. Puncture-proof liner obtainable from Container Corporation of America, Plastics division, 30-gal. CK Tank No. 1829.
i. A TID is installed on each container by the waste generator.

3. For newly generated wastes, procedures must be developed and implemented to characterize hazardous waste using acceptable knowledge prior to packaging the waste at the generator site. These procedures must include the following information (WIPP Waste Analysis Plan [WAP]):

    a. Scope (i.e., waste streams) and purpose

    b. Responsible organization(s)

    c. Administrative process controls

    d. Material inputs to process

    e. Process controls and range of operation that affect final hazardous waste characterization

    f. Rate and quantity of the hazardous waste generated

    g. List of applicable operating procedures relevant to the hazardous waste characterization

    h. Acceptable knowledge verification sampling (i.e., headspace gas sampling and/or solidified homogeneous waste annual sampling)

    i. Reporting and records management.

### 4.11.2 Documentation Requirements

1. To meet the minimum documentation requirements of 40 CFR 268.7(a)(4), each shipment, as applicable, includes:

    a. EPA identification number

    b. Generator's name

    c. EPA Form 8700-22, Uniform Hazardous Waste Manifest (40 CFR 263)

    d. Manifest number

    e. Waste stream identification number

    f. A list of applicable wastes, with EPA hazardous waste number and treatment standards for each constituent

    g. Waste analysis data

    h. Proper land disposal restriction notification as set forth in 40 CFR 268.32 or RCRA Section 3004 (d), if applicable

    i. Generator's signature and date.

2. Approved Land Disposal Restriction (LDR) information that must accompany each shipment includes (WIPP WAP).

    a. Shipment number

b. Description of waste by an approved Item Description Code or list of waste constituents

c. A list stating the EPA hazardous waste number, treatment standard, and manifest number or line for any waste subject to LDR, if applicable

d. For mixed Transuranic waste for disposal at WIPP, the following statement: "I certify under penalty of law that the mixed waste identified on manifest number _____ and bearing the EPA Hazardous code numbers _____ are designated as transuranic (TRU) mixed waste and have been exempted from the land disposal prohibitions of 40 CFR 268 by the Land Withdrawal Act Amendments (Public Law 104-210). This amendment exempts WIPP waste from treatment standards promulgated pursuant to Section 3004(m) of the Solid Waste Disposal Act (42 U.S.C. 6924(m)) and are not subject to the Land Disposal Prohibition in Section 3004 (d), (e), (f), and (g) of the Solid Waste Disposal Act."

3. Generators shipping mixed TRU waste to the RWMC must provide the following required acceptable knowledge documentation (WIPP WAP):

a. Map of the site with the areas and facilities involved in mixed TRU waste generation, treatment, and storage identified.

b. Facility mission description as related to mixed TRU waste generation and management.

c. Description of the operations that generate mixed TRU waste.

d. Waste identification or categorization schemes used by the generator.

e. Types and quantities of mixed TRU waste generated, including historical generation through future production.

f. Correlation of waste streams generated from the same building and process, as appropriate (e.g., sludge, combustibles, metals, glass).

g. Waste certification procedures for newly generated wastes to be sent to the WIPP facility if different from those controlled by the TRU program.

h. Waste process information, including:

(1) Area(s) or buildings from which the waste stream is generated.

(2) Waste stream volume and time period of generation.

(3) Waste generating process for each building.

i. Process flow diagrams. In the case of research/development, analytical laboratory waste, or other similar processes where process flow diagrams cannot be created, a description of the waste generating processes, rather than a formal process flow diagram, may be included if this modification is justified and this justification is placed in the auditable record.

j. Material inputs or other information that identifies the chemical content of the waste stream and the physical waste form.

k. A summary that identifies all sources of waste characterization information used to delineate the waste stream.

l. Identification and justification of assumptions made in delineating each waste stream.

4. Generators shipping mixed TRU waste to the RWMC must submit to the TRU Program, as requested, the following supplemental acceptable knowledge documentation in addition to the required information listed above (WIPP WAP):

a. Process design documents.

b. Standard operating procedures, which may include a list of raw materials or reagents, a description of the process or experiment generating the waste, and a description of wastes generated and how the wastes are managed at the point of generation.

c. Preliminary and final safety analysis reports and technical safety requirements.

d. Waste packaging logs.

e. Test plans or research project reports that describe reagents and other raw materials used in experiments.

f. Generator facility databases (e.g., chemical inventory database for Superfund Amendments and Reauthorization Act Title III requirements).

g. Information from generator personnel (e.g., documented interviews).

h. Standard industry documents (e.g., vendor information).

i. Analytical data relevant to the waste stream, including results from fingerprint analyses, spot checks, or routine verification sampling. This may also include new information acquired apart from the confirmatory process that supplements required information (e.g., visual examination not performed in compliance with the WIPP WAP).

j. Material Safety Data Sheets, product labels, or other product package information.

k. Sampling and analysis data from comparable or surrogate waste streams (e.g., equivalent nonradioactive materials).

l. Laboratory notebooks that detail the research processes and raw materials used in an experiment.

### 4.11.3 Waste Contents Requirements

1. The waste does not contain.

a. Incompatible wastes within the same container or on the same pallet (WIPP WAC, TRAMPAC, RCRA Permit, 49 CFR 177.848).

b. Waste codes not included in the RCRA Permit.

2. Waste from foreign sources is prohibited (RCRA Permit).

### 4.11.4 Additional Requirements for Mixed Remote-Handled TRU Waste

Acceptance of Mixed TRU waste for storage at the RWMC Intermediate Level Transuranic Storage Facility (ILTSF) is prohibited. RCRA permitted storage at RWMC is available at the RCRA-permitted storage module where the waste must be overpacked in an engineered shielded overpack. The surface dose of the shielded overpack must not exceed 200 mr/hr at contact at the time of shipping or due to decay and future in-growth.

### 4.11.5 Mixed TRU Waste to be Stored and Treated at CPP-659 or Stored at CPP-659, CPP-1659, and CPP-666

Contact handled and remote handled Mixed TRU Waste to be Stored and Treated at CPP-659 or Stored at CPP-659, CPP-1659, and CPP-666 must meet the requirements of Section 4.7.6.

## 4.12 High-Level Waste

### 4.12.1 Remote-Handled HLW to be Stored at Calcined Solids Storage Facility

Capability exists at INTEC to store HLW that has been calcined. The Calcined Solids Storage Facility (CSSF) is used for interim storage of granular solids produced from the calcination process. Further additions of calcine to the CSSF are not currently planned. If this changes in the future, Waste Acceptance Criteria will be established.

### 4.12.2 Remote-Handled Liquid Radioactive Waste to be Treated at INTEC (CPP-659, CPP-1618, and CPP-604)

The NWCF HLLWE at INTEC provides pretreatment of liquid radioactive waste by concentrating the waste solution through evaporation of the water in the solution. The wastes that may be treated in the evaporator tank system are analyzed on a case-by-case basis and modeled using the Aspen Computer Model. If a waste stream is determined to be acceptable for processing in the evaporator system, it is specified in PLN-17. Concentrated liquids will be treated into final form at other appropriate facilities.

The LET&D currently at INTEC provides treatment of PEWE overheads by concentrating liquid bottoms and removing the water from the solution by vaporization. The Waste Acceptance Criteria for the LET&D are established in PRD-166, “INTEC PEWE Chemical Acceptance Criteria.”

### 4.12.3 Remote-Handled Liquid Radioactive Waste to be Stored at the INTEC Tank Farm Facility

The TFF currently at INTEC provides interim storage of liquid radioactive waste. Wastes proposed for storage in this facility undergo a hazardous waste determination by WGS (PRD-166). Operations personnel shall review the information to provide the final approval for waste acceptance into the unit.

### 4.12.4 Remote-Handled HLW to be Stored at Container Storage D-Cell (CPP-601)

Mixed wastes received for storage at the D-cell container storage unit must have only those EPA hazardous waste numbers identified in the unit’s RCRA Part-A application. Volumes of waste accepted in the unit may not result in the Part-A permit capacity limits being exceeded.

Waste Acceptance Criteria for this unit will be established.

### 4.12.5 High-Level Waste to be Stored and Treated at CPP-659 or Stored at CPP-659, CPP-1659, and CPP-666

High-level waste to be stored and treated at CPP-659 or stored at CPP-659, CPP-1659, and CPP-666 must meet the requirements of Section 4.7.5.

### 4.12.6 INTEC Waste Incidental to Reprocessing Determination Wastes

Waste originating from high-level waste systems may have a Waste Incidental to Reprocessing (WIR) determination to classify them as a waste type other than high-level waste. Waste Acceptance Criteria for WIR wastes will be developed in accordance with the appropriate disposal site Waste Acceptance Criteria and PLN-1036, "Waste Incidental to Reprocessing Determination Activities."

## 4.13 Acceptance Criteria for Glovebox Excavator Method Project Waste

The following acceptance criteria apply to waste from the OU 7-10 Glovebox Excavator Method (OU 7-10) Project to be stored at WMF-628 or the OU 7-10 Interim Storage Area. These waste streams will include all waste retrieved from the OU 7-10 project, as well as secondary and D&D&D wastes. Waste types that may be accepted include:

- TSCA regulated waste
- CERCLA regulated waste
- Mixed transuranic (TRU) waste
- Transuranic waste
- Mixed low-level waste.

Other waste types such as Low-Level waste, industrial waste, and hazardous waste may also be stored in the Interim Storage Area but will be managed in accordance with the applicable sections of the INEEL WAC.

The purpose of this section is to define the requirements for accepting the waste generated from the OU 7-10 project for storage at WMF-628 or the OU 7-10 Interim Storage Area, (including the RCRA/TSCA compliant portable storage units). These requirements are based on the RWMC HWMA/RCRA Part B Permit, DOE orders, RWMC safety basis, and applicable Code of Federal Regulations.

Wastes, which do not meet the criteria in this section, may be accepted by the facility manager for storage, on a case-by-case basis following an evaluation of the waste and available information to ensure it meets the requirements of the facility authorization basis.

For Waste produced by the OU 7-10 project, the only waste acceptance requirements applicable to WMF-628 or the OU 7-10 Interim Storage Area are the criteria listed in this section or referenced in this section.

Wastes that are generated from the OU 7-10 project will be managed as CERCLA waste. The waste will be considered newly generated waste, and the generator must comply with the RWMC HWMA/RCRA Part B Permit requirements for any newly generated wastes that are stored in

WMF-628.While in the interim CERCLA storage, the waste acceptance criteria listed below will apply in addition to the project specific CERCLA ARARs. The permit requirements do not apply to the interim CERCLA storage area.

### 4.13.1 Acceptance Criteria

1. All wastes will be characterized and have appropriate hazardous waste codes identified (e.g., through process knowledge and/or sampling and analysis) before they are accepted for storage in WMF-628.

2. All containers that are suspected to contain PCBs must also meet the requirements in Sections 4.8.1(3) and 4.8.1(6).

3. Containers shall contain ≤ 200 Pu-239 fissile gram equivalents and meet the TRU waste fissile material concentration limits listed in Table 4.10.4-1.

4. Wastes with the RCRA D003 Reactive Waste Code may only be stored in the Portable Storage Units and shall be individually evaluated by the OU 7-10 nuclear facility manager to ensure proper handling and storage.

5. All mixed low-level waste will be disposed in accordance with the appropriate Waste Acceptance Criteria of the selected disposal facility, and will be stored and managed in accordance with the criteria of this section.

6. TRU waste with no identified path to disposal must be generated only in accordance with DOE Guide 435.1-1, Chapter III, H (2), and is managed on a case-by-case basis as approved by the facility manager.

### 4.13.2 Documentation Requirements

1. A completed INEEL Waste Tracking System (IWTS) Material and Waste Characterization Profile (M&WCP).

2. An approved IWTS Container Profile and Shipment Task Profile (for electronic submittal) or Shipment Request and Certification Report (for hardcopy submittal)

3. Properly completed shipping papers as required (e.g., Bill of Lading or other acceptable shipping papers)

4. The number of layers of plastic containment shall be documented in the Container Comments Screen of IWTS (RCRA Permit).

5. For TRU and Mixed TRU waste it must be documented in the Container Comments Screen of IWTS that the waste is defense related and the waste is generated from “Defense nuclear waste and materials by-products management.”

### 4.13.3 Packaging Requirements

The following packaging and labeling requirements must be met in addition to the requirements of Section 4.4.

1. Dry-loaded waste containers, such as drums, boxes, or inserts with potential for free liquids have an absorbent or stabilizing agent used to ensure immobilization of free liquid because free liquids are not accepted. (RCRA Permit).

2. Absorbents and stabilizing agents used to eliminate free liquids, per DOE O 435.1, have undergone the generator's bench-scale testing. The testing must demonstrate that the absorbent or stabilizing agents eliminate free liquids from the waste as specified by the vendor or that an improved specific-use methodology has been developed (DOE O 435.1). An acceptable free liquid test that complies with SW-846 method 9095 is Engineering Design File (EDF)-2761. "Free Liquid Test Method for Low Level Waste Absorbed/Immobilized Liquids."

3. All waste retrieved from the pit will be repackaged into containers that must pass 49 CFR 173.412 design requirements and 49 CFR 173.475 control requirements. (RCRA Permit)

4. Containers must be sealed with a tamper-indicating device (TID), which is to be installed on each container by the generator. (49 CFR 173.412).

5. Wastes are compatible with each other and with the packaging materials (RCRA Permit).

6. Each waste container of TRU waste must be vented to allow the release of hydrogen gas according to the following requirements (RCRA HWMA/RCRA Part B Permit, Attachment 2, C-1c, SAR-4, Section 2.5.5).

7. Packages containing TRU mixed wastes are required to be compliant with DOT regulations promulgated in 49 CFR 173 or United Nations (UN) specifications with a supplemental 7A Type A certification.

8. Waste containers must be visually verified to be in good condition (e.g., severe rusting, apparent structural defects) or free of leaks prior to be accepted into storage. If the container does not meet this criteria the owner or operator must transfer the waste from this container to a container that is in good condition that meets the proper shipping requirements for this waste type, or manage the waste in some other way that complies with the requirements of 40 CFR 264 Subpart I (40 CFR 264.171).

9. All CERCLA remediation waste will be labeled with CERCLA waste labels that include the following information:

    a. Accumulation start date

    b. Waste description

    c. Potential and final waste codes

    d. Name of waste generator

    e. Waste generator address

    f. "Hazardous Waste"

    g. Waste tracking number

    h. PCB if PCB concentration is greater that 50 PPM.

### 4.13.4 Prohibited Items

Wastes, which are outlined in this section, may be accepted by the facility manager for storage, on a case-by-case basis following an evaluation of the waste and available information to ensure proper handling, storage, and disposal.

1. A material capable of generating toxic quantities of gases, vapor, or fumes (RCRA Permit)
2. Etiologic agents (RCRA Permit, 32 CFR 627.32 and 627.34)
3. Pressurized containers that are not vented, drained, crushed, or otherwise reconfigured to prevent pressurization (RCRA Permit)
4. Radioactive pyrophorics > 1% of the waste weight (RCRA Permit)
5. Nonradioactive pyrophorics (RCRA Permit)
6. Spent nuclear fuel (RCRA Permit)
7. High-level waste (RCRA Permit).

## 4.14 Acceptance Criteria for AMWTP Reject Waste

The following acceptance criteria apply to the waste streams that will be returned to RWMC from the British Nuclear Fuels Limited Advanced Mixed Waste Treatment Project (AMWTP). It is expected that the AMWTP will encounter these RH wastes and waste in shielded containers during processing of wastes retrieved from within the Transuranic Storage Area (TSA). It is assumed that these wastes will be rejected by the AMWTP and returned to the Radioactive Waste Management Complex (RWMC) for storage at WMF-628 or at the Intermediate Level Transuranic Storage Facility (ILTSF) and future disposition by the INEEL Management and Operations (M&O) contractor. Wastes anticipated to be returned from the AMWTP that will be managed by the RWMC include:

- Suspect (shielded containers) RH TRU waste from Rocky Flats – 220 $m^3$
- U-233 RH debris waste – 52 $m^3$
- U-233 RH non-irradiated fuel – 73 $m^3$

The purpose of this document is to define the requirements for accepting the rejected waste for storage at RWMC. These requirements are based on the RWMC HWMA/RCRA Part B Permit, DOE Orders, and applicable Code of Federal Regulations. Wastes which do not meet the criteria in this section may be accepted for storage, but only following a case-by-case evaluation by the INEEL M&O contractor that is approved by the designated NE-ID representative prior to transfer. The designated NE-ID personnel will be identified via contracting officer letter to the INEEL M&O contractor. Examples of specific conditions that may warrant a case-by-case evaluation include:

- The absence of information on the original program or generator of the waste
- Potential presence of absorbent used to eliminate free liquids
- Incomplete waste characterization (including unknown hazardous constituents)
- Unknown content code or Item Description Code
- Waste containers with specific handling or storage requirements.

The waste within TSA that was received on or prior to September 11, 1991, is considered to be part of the “existing inventories” as defined by the RWMC HWMA/RCRA Part B Permit. This includes wastes within the TSA-Retrieval Enclosure (RE). Because the wastes retrieved from the TSA are classified as existing wastes, the TSA waste rejected from AMWTP waste processing need only meet acceptance criteria for “existing inventories” for RWMC storage. Newly generated TRU waste characterization requirements are not applicable to wastes retrieved from the TSA. If, however, the retrieved wastes are treated or are commingled with other wastes, these wastes will be considered newly generated. Because the TSA waste returned from the AMWTP is considered “existing waste,” the

AMWTP will not generally be considered a waste generator as defined by the RWMC HWMA/RCRA Part B Permit. Additionally, overpacking of existing waste containers will not create "newly generated" waste. If newly generated CH TRU wastes are to be dispositioned to RWMC, the applicable RRWAC sections for CH TRU and mixed CH TRU will apply. The AMWTP must further comply with the Permit requirements for any newly generated wastes created.

AMWTP waste that cannot be treated (as defined by the AMWTP WAC) will be characterized in accordance with the INEEL RWMC HWMA/RCRA Part B permit for storage and/or to meet the WIPP WAC, or other mutually agreed upon disposal requirements. This uncharacterized waste is not anticipated to contain additional waste codes or to be significantly different in physical characteristics than the existing, characterized waste covered in the RWMC HWMA/RCRA Permit.

It is anticipated that unknown wastes and wastes that cannot be treated by the AWMTP will be encountered during retrieval operations. The RWMC HWMA/RCRA Part B Final Permit, (Attachment 6.B) allows for the storage of "unknowns" in the waste storage facilities pending characterization. The AMWTP will characterize these waste streams for long-term storage at the RWMC; however, the RWMC will be responsible for semiannual reporting to the state of Idaho in accordance with Section II.K.4 of the RWMC HWMA/RCRA Permit. In accordance with RWMC HWMA/RCRA Permit Condition II.K.1, characterization of unknown waste must be completed within 60 months from the day the waste is placed into storage at RWMC.

The RWMC and the AMWTP waste storage facilities have the same EPA Identification (ID) Number. Because the waste will be transferred between storage facilities having the same EPA ID Number and because the waste is contained within the same site area, transportation documentation required for waste transfers will be limited. For example, Hazardous Waste Manifests and Land Disposal Restriction notifications will not be required.

The RWMC has historically used both the Integrated Waste Tracking System (IWTS), for incoming waste streams, and the Transuranic Reporting, Inventory, and Processing System (TRIPS), for waste tracking within the facility and for off-site shipments. The IWTS will be the primary waste tracking system for AMWTP reject waste accepted for storage by the INEEL M&O contractor. This will be consistent with the waste tracking system used for the INEEL.

The criteria are arranged according to the type of requirement. General requirements are listed first, followed by documentation-related requirements, packaging requirements, waste content requirements, and handling requirements.

### 4.14.1 Requirements Applicable to All Returned AMWTP Reject TRU Wastes

#### *4.14.1.1 General Requirements*

1. The Waste Generator Services (WGS) and TRU waste projects interface must be contacted before TRU waste is packaged or scheduled for return to RWMC for storage.

2. TRU waste with no identified path to disposal, if generated, must be generated only in accordance with DOE Manual 435.1-1, Chapter III, H (2), and is managed on a case-by-case basis. If the waste is newly generated, then other RRWAC sections, such as TRU and mixed TRU (Sections 4.10 and 4.11, respectively) may be applicable.

3. 100% of the waste containers must be visually inspected for integrity and proper identification prior to transfer from the AMWTP to the RWMC [RWMC HWMA/RCRA Part B Permit, Attachment 2, Section C-3f (1)]. The container integrity inspection criteria are as follows:

    a. Rust or corrosion must be considered significant if it meets the following descriptions and extends uninterrupted for more than 10 inches around the drum circumference:

        (1) Rust is present in thick caked layers or deposits

        (2) Rust has created deep pits in the metal

        (3) Rust is present in the form of deep metal flaking or thick built-up areas of corrosion products.

    b. Deep dents in the top, sides, bottom, or bottom chine must be assessed to determine if they interfere with the waste processing equipment.

    c. Containers must be inspected for obvious leaks, holes, through-wall cracks, tears, or broken welds that are breached. Cracks in or pieces missing from the bottom chine are unacceptable.

    d. Pinholes and breaches as a result of rust/corrosion must be assessed.

    e. The fastener and fastener ring (chine) must be inspected for damage or excessive corrosion. The alignment of the ring must be checked to ensure the container will not open during handling.

    f. The container must be examined near vents, top ring(s) or lid fittings, bottom ring(s), welds, seams and intersections of one or more metal sheets or plates.

    Containers having any of these attributes or that have any evidence of leaking are not acceptable and must be rejected or overpacked in an allowable container.

4. Radiation levels of waste packages must be verified by the RWMC receiving organization to agree with those reported by the AMWTP at the time of transfer to within the following amounts (BMP):

    a. $\pm$100% for reported levels <10 mR/hr

    b. $\pm$20% for reported levels $\geq$10 mR/hr.

5. As available, the program from which the waste originates should be identified for the purpose of determining if the waste is atomic energy defense-related. Applicable atomic energy defense-related programs are (DOE Guide 435.1-1, Chapter 3, Section III. G):

    a. Naval reactors development

    b. Weapons activities, including defense inertial confinement fusion

    c. Verification and control technology

    d. Defense nuclear materials production

e. Defense nuclear waste and materials by-products management

f. Defense nuclear materials security and safeguards and security investigations

g. Defense research and development.

#### *4.14.1.2 Documentation Requirements*

1. An INEEL Waste Determination and Disposition Form or AMWTP equivalent must be completed by the AMWTP and must be approved by INEEL M&O contractor before the waste transfer or shipment (RWMC HWMA/RCRA Part B Permit, Attachment 2, Sections C-1 and C-3b).

2. The IWTS Material and Waste Characterization Profile (M&WCP) has been approved by the RWMC WGS representative (RWMC HWMA/RCRA Permit, Attachment 2, Section C-1e). A completed AMWTP waste tracking system record, equivalent to the M&WCP, may be used to supply information to IWTS.

3. A completed IWTS Container Profile, Shipment Task Profile or equivalent (for electronic submittal), and Shipment Request Form have been reviewed by the INEEL M&O contractor before the waste transfer (RWMC HWMA/RCRA Permit, Attachment 2, Sections C-1, C-1b, and C-1e).

4. A waste tracking form has been completed prior to transferring the container from the AMWTP to the INEEL M&O contractor. Information and data must be entered on this form for each container retrieved during container inspection and labeling operations. The following information, as applicable, is recorded on the form [RWMC HWMA/RCRA Permit, Attachment 2, Section C-3f (2)]:

    a. Content code/Item Description Code

    b. Weight

    c. RCT Survey

    d. Inspection label

    e. RCRA label

    f. RADCON label

    g. TSCA label

    h. Segregation area designation

    i. Bar-code number

    j. Container identification number.

***4.14.1.3 Packaging Requirements.*** The following packaging requirements must be met in addition to the requirements of Section 4.4:

1. The waste must be packaged in one of the following standard containers [RWMC HWMA/RCRA Part B Permit, Attachment 1.B Section D-1a (2)(1)]:

    a. Department of Transportation (DOT) 7A Type A or UN1A2 55-gal. drum.

    b. RH-TRU Shielded Overpack (30 or 55 gal. drum overpack assemblies with internal shielding to reduce external dose rates to contact-handled levels).

    c. DOT 7A Type A or UN1A2 30-gal. drum.

    d. DOT 6M packaging of 55-gal. or 110-gal. size with an internal DOT 2R inner containment vessel. The 2R containment vessel is made of stainless or carbon steel with a maximum inside diameter of 5.25 in. For Bettis Atomic Power Laboratory, 5 in. Schedule 40 piping has been approved for use as a container.

    e. DOT 7A Type A or UN1A2 55/83/85 gal. overpack drum.

    f. DOT 7A Type A Transuranic Waste Package Transporter-II (TRUPACT-II) Standard Waste Box.

    g. DOT 7A Type A Mark III box with lead liner, as necessary.

    h. Additional container types may be accepted on a case-by-case basis. For instances where the container type is not in the RWMC HWMA/RCRA Part B Permit [Attachment D-1a (2)(1)] or does not meet the specified packaging requirements, DOE-ID must approve all nonstandard waste packaging prior to acceptance at RWMC. (Note that any container types not presently listed in the RWMC Permit will require a Class I modification notice to the Permit. These modifications must be submitted within seven days after the change has been put into effect.)

2. Each waste container must be vented to allow the release of hydrogen gas according to the following requirements [40 CFR 173.412, "Additional design requirements for Type A packages;" DOE M 435.1-1, *Radioactive Waste Management Manual*, Chapter III, Section L (1)(a)]:

    a. Each container must have one or more filter vents

    b. Container filter vents must meet appropriate disposal facility (e.g., WIPP) specifications

    c. Container rigid liner and any inner waste packages greater than 4 L, if present, have been vented or filtered (to the extent that can be checked)

    d. Container vent installation date and model number of each filter element is recorded.

3. The container identification(s) for inner container must be provided in case of overpacks.

4. Marking and labeling requirements for each container include the following [RWMC Permit, Attachment 1.B, Section D-1a (2)(1)]:

    - Barcode (meeting ANSI/AIM BC1-1995 Code 39, Uniform Symbology Specification)

- Radiation label
- Hazard label
- Hazardous waste label, as appropriate.

5. Waste packages must comply with the requirements in Table 4.14.1.3-1.

Table 4.14.1.3-1. Contact-handled TRU waste containers to be stored at RWMC WMF-628.

| Characteristic | DOT 7A Type A or UN1A2 55-gal. Drum | DOT 7A Type A or UN1A2 30-gal Drum | DOT 6M Packaging | DOT 7A Type A or UN1A2 83/85 gal. Drum | TRUPACT-II Standard Waste Box (SWB) | DOT 7A Type A Mark III Box | Criterion Basis |
|---|---|---|---|---|---|---|---|
| Gross weight | ≤800 lbs | ≤400 lbs[a] | ≤640 lbs (both 55- and 110-gal.) | ≤1125 lbs | ≤4000 lbs | ≤21,800 lbs | WIPP WAC, 49 CFR 178.354 |
| Dimension | 35 in. high x 24 in. dia. | 29.5 in. high x 20 in. dia. | 35 in. high x 24 in. dia. (55-gal)<br>62 in. high x 24 in. dia. (110-gal.) | 36 in. high x 25.6 in. dia. (inside dimensions) | 71 in. long x 54 in. wide x 37 in. high | 96 in. long x 48 in. wide x 48 in. high | |
| Surface dose rate (contact) | ≤200 mrem/hr | ≤200 mrem/hr | ≤200 mrem/hr | ≤200 mrem/hr | ≤200 mrem/hr | ≤200 mrem/hr | 49 CFR 173.441 |
| Fissile material[b, c] | ≤380 FGE Pu-239 | ≤380 FGE Pu-239 | ≤380 FGE Pu-239/ package | ≤380 FGE Pu-239 | ≤380 FGE Pu-239 | ≤380 FGE Pu-239 | RWMC TSR (INEL-94-0076, Rev 9) |
| Tamper indicating device (TID)[c d] | Yes | Yes | Yes | Yes | Yes | Yes | 49 CFR 173.412 |

a. Handling limitation at the RWMC.
b. Fissionable material limits are based on assumed low-density waste contaminated with small amounts of volumetric averaged fissionable material. Low-density waste is waste consisting of materials such as paper, polyethylene wrap, tape, glass, rags, blotting paper, scrap metal, and piping. The fissile material limit is the limit listed in the table minus twice the absolute value of the error for the measuring equipment used.
c. Individual waste containers exceeding these limits will require isolation pending further evaluation by the INEEL M&O contractor.
d. A TID is installed on each container.

#### *4.14.1.4 Waste Contents Requirements*

1. Isotopes must be identified and reported with respect to activity and weight of the material containing the activity (RWMC HWMA/RCRA Part B Permit, Attachment 2, C1b, Request for Radioactive Material Shipment.)

2. For DOT 6M containers, the U-233 limit is 500 g (RWMC SAR-4, Section6.4.2.2)

#### *4.14.1.5 Waste Handling Requirements*

1. Removable surface contamination on each waste container does not exceed 200-dpm/100 $cm^2$ beta-gamma and 20-dpm/100 $cm^2$ alpha [49 CFR 173.443 (a), 10 CFR 835].

2. External radiation dose rates of individual containers must be $\leq$200 mrem/hr at the surface and $\leq$10 mrem/hr at 2 m from the container (49 CFR 173.441).

### 4.14.2 Additional Requirements for Returned Remote-Handled TRU Waste

In addition to meeting the requirements in Sections 4.13.1.1 to 4.13.1.5, with the exception of the surface radiation dose rate limit, the following acceptance criteria must also be met before shipping remote-handled (RH) TRU waste to the RWMC.

1. The waste is packaged in any of the following standard containers [RWMC HWMA/RCRA Part B Permit, Attachment 1.B, D-1a (2)(1)]:

   a. DOT Type A, 55-gal. drum (ILTSF storage only) – non-mixed waste only

   b. DOT Type A, 30-gal. drum (for ILTSF storage only) – non-mixed waste only

   c. RH TRU shielded overpack containing a DOT Type A 30- or 55-gal drum (WMF-628 only).

   **NOTE:** *RH TRU may be stored at the RWMC ILTSF as evaluated on a case-by-case basis. In this instance, overpacking the 30- or 55-gal waste container in an RH shielded overpack is not required provided they meet the container storage requirements. All other RH waste to be stored at the RWMC must be overpacked in an RH shielded overpack such that the surface dose rate is ≤200 mrem/hr at contact.*

2. The container identification number on a RH waste container must be:

   a. Permanently attached to the container top

   b. Visible and legible to remote, visible verification equipment

   c. Directly traceable to waste package content documentation.

3. The RH waste containers shall comply with the requirements listed in Table 4.13.2-1 [DOE G 435.1-1, Chapter 3, III.L. (1)(b)].

Table 4.14.2-1. Remote-handled TRU waste containers (ILTSF vault or WMF-628).

| Characteristic | DOT Type A 55-gal. Drum[a] | DOT Type A 30-gal. Drum[a] | RH TRU Shielded Overpack[b] | Criterion Basis |
|---|---|---|---|---|
| Gross weight | ≤800 lbs | ≤400 lbs[c] | Varies | Design |
| Dimension | 35 in. high x 24 in. dia. | 29.5 in. high x 20 in. dia. | 32 in. outside diameter (25 in. inside diameter) | Design |
| Surface dose rate | >200 mrem/hr ≤30 R/hr[d] | >200 mrem/hr ≤30 R/hr[d] | ≤200 mrem/hr | 49 CFR 173.441 and RWMC SAR-4 Section 2.4.2.1 |
| Fissile material[e,f] | ≤380 FGE Pu-239 | ≤380 FGE Pu-239 | ≤380 FGE Pu-239 | RWMC TSR (INEL-94-0076, Rev. 9) |
| Inner container | N/A | N/A | DOT Type A 55 gallon or 30 gallon drum. | |
| TID[e] | Yes | Yes | Yes | 49 CFR 173.412 |

a. ILTSF storage only unless overpacked in shielded container.
b. Containing a single 30- or 55-gal DOT Type A container.
c. Handling limitation at the RWMC.
d. Upper radiation limit based on INEEL free-air transfer safety considerations.
e. A TID is installed on each container by the waste generator.
f. Individual waste packages exceeding these limits will require isolation and further evaluation.

## 4.14.3 Requirements for Returned Mixed TRU Waste

In addition to the acceptance criteria presented in Section 4.13.1, the following additional acceptance criteria apply to all mixed TRU waste to be returned to the RWMC for storage. The criteria are arranged according to the type of requirement. General requirements are listed first, followed by documentation-related requirements, packaging requirements, waste content requirements, and transportation requirements.

### *4.14.3.1 Documentation Requirements*

1. To meet the minimum documentation requirements of 40 CFR 268.7(a)(4), each transfer, as applicable, includes:

    a. EPA identification number

    b. Generator's name

    c. Waste stream identification number

    d. A list of applicable wastes, with EPA hazardous waste number and treatment standards for each constituent

    e. Waste characterization data.

#### *4.14.3.2 Waste Contents Requirements*

1. The waste does not contain:

    a. Incompatible wastes within the same container or on the same pallet (RWMC HWMA/RCRA Permit Attachment 2 C-1a (1), 49 CFR 177.848).

    b. Waste codes not included in the RWMC HWMA/RCRA Permit, Attachment 1, Part A.

### 4.14.4 Additional Requirements for Mixed Remote-Handled TRU Waste

Acceptance of Mixed RH-TRU waste for storage at the RWMC ILTSF is prohibited. RCRA permitted storage at RWMC is available at the waste storage module where the waste must be overpacked in an engineered shielded overpack. The surface dose of the shielded overpack must not exceed 200 mrem/hr at contact at the time of shipping or due to decay and future in-growth of radionuclides.

# 5. REFERENCES

## Code of Federal Regulations (CFR)


1. 10 CFR 40, “Domestic Licensing of Source Material.”
2. 10 CFR 61, “Licensing Requirements for Land Disposal of Radioactive Waste.”
3. 10 CFR 830.120, “Nuclear Safety Management,” “Scope.”
4. 29 CFR 1910, “Occupational Safety and Health Standards.”
5. 29 CFR 1910.1200, “Labor,” “Hazard Communication.”
6. 32 CFR 627.32, “The Biological Defense Safety Program, Technical Safety Requirements,” “Introduction.”
7. 32 CFR 627.34, “Disposal.”
8. 40 CFR 60 Appendix A, “Standards of Performance for New Stationary Sources,” “Test Methods.”
9. 40 CFR 61, “National Emission Standards for Hazardous Air Pollutants.”
10. 40 CFR 61.141, “National Emission Standards for Hazardous Air Pollutants,” “Definitions.”
11. 40 CFR 61.157, “National Emission Standards for Hazardous Air Pollutants,” “Delegation of Authority.”
12. 40 CFR 82.156, “Protection of Stratospheric Ozone, Recycling, and Emissions Reduction, Required Practices.”
13. 40 CFR 191, “Environmental Radiation Protection Standards for Management and Disposal of Spent Nuclear Fuel, High-Level and Transuranic Radioactive Waste.”
14. 40 CFR 243.101, “Guidelines for the Storage and Collection of Residential, Commercial and Industrial Solid Waste.”
15. 40 CFR 260.10, “Hazardous Waste Management System: General,” “Definitions.”
16. 40 CFR 261, “Identification and Listing of Hazardous Waste.”
17. 40 CFR 261.1, “Purpose and Scope.”
18. 40 CFR 261.2, “Definition of Solid Waste.”
19. 40 CFR 261.3, “Definition of Hazardous Waste.”
20. 40 CFR 261.4, “Exclusions.”
21. 40 CFR 261.7, “Residues of Hazardous Waste in Empty Containers.”

22. 40 CFR 261.11, “Criteria for Listing Hazardous Waste.”

23. 40 CFR 261.21, “Characteristic of Ignitability.”

24. 40 CFR 261.23, “Characteristic of Reactivity.”

25. 40 CFR 261.24, “Toxicity Characteristic.”

26. 40 CFR 261.31, “Hazardous Wastes from Non-Specific Sources.”

27. 40 CFR 261.32, “Hazardous Wastes From specific Sources.”

28. 40 CFR 261.33, “Discarded Commercial Chemical Products, Off-Specification Species, Container Residues, and Spill Residues.”

29. 40 CFR 261, Subpart D, “Lists of Hazardous Waste.”

30. 40 CFR 261, Subpart C, “Characteristics of Hazardous Waste.”

31. 40 CFR 261.141 “National Emission Standards for Hazardous Air Pollutants,” “Definitions.”

32. 40 CFR 262, “Standards Applicable to Generators of Hazardous Waste.”

33. 40 CFR 262.11, “Hazardous Waste Determination.”

34. 40 CFR 262.32, “Marking.”

35. 40 CFR 263, “Standards Applicable to Transporters of Hazardous Waste.”

36. 40 CFR 264.17, “General Requirements for Ignitable, Reactive, or Incompatible Wastes.”

37. 40 CFR 264, “Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities.”

38. 40 CFR 264.177, “Special Requirements for Incompatible Wastes.”

39. 40 CFR 264.316, “Disposal of Small Containers of Hazardous Waste in Overpacked Drums (Labpacks).”

40. 40 CFR 265, “Interm Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage and Disposal Facilities.”

41. 40 CFR 265.316, “Disposal of Small Containers of Hazardous Waste in Overpacked Drums (Labpacks).”

42. 40 CFR 265.1086, “Standards: Tanks.”

43. 40 CFR 266, Subpart F, “Recyclable Materials Utilized for Precious Metal Recovery.”

44. 40 CFR 266.70, “Recyclable Materials Utilized for Precious Metal Recovery,” “Applicability and Requirements.”

45. 40 CFR 268, “Land Disposal Restrictions.”

46. 40 CFR 268.2, “Definitions,” applicable to this part.

47. 40 CFR 268.3, “Dilution Prohibited as a Substitute for Treatment.”

48. 40 CFR 268.7, “Waste Analysis and Recordkeeping.”

49. 40 CFR 268, Subpart D, “Treatment Standards.”

50. 40 CFR 268.32, “Waste Specific Prohibitions - California List Wastes.”

51. 40 CFR 268.40, “Applicability of Treatment Standards.”

52. 40 CFR 268.42, “Treatment Standards Expressed as Specified Technologies.”

53. 40 CFR 268.45, “Treatment Standards for Hazardous Debris.”

54. 40 CFR 268.48, “Universal Treatment Standards.”

55. 40 CFR 268.50, “Prohibitions on Storage of Restricted Wastes.”

56. 40 CFR 268 Appendix IV, “Land Disposal Restrictions,” “Waste Excluded From Labpacks Under the Alternative Treatment Standards” or 268.42(c).

57. 40 CFR 279, “Standards for the Management of Used Oil.”

58. 40 CFR 761, “Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions.”

59. 40 CFR 761.3, “Definitions.”

60. 40 CFR 761.20, “Prohibitions and Exceptions.”

61. 40 CFR 761.40, “Marking Requirements.”

62. 40 CFR 761.45, “Marking Formats.”

63. 40 CFR 761.50, “Storage and Disposal,” “Accountability.”

64. 40 CFR 761.60, “Disposal Requirements.”

65. 40 CFR 761.61, “PCB Remediation Waste.”

66. 40 CFR 761.62, “Disposal of PCB Bulk Product Waste.”

67. 40 CFR 761.63, “PCB Household Waste Storage and Disposal.”

68. 40 CFR 761.64, “Disposal and Wastes Generated as a Results of Research and Development Activities Authorized Under 761.(j) and Chemical Analysis of PCBs.”

69. 40 CFR 761.79, “Contamination Standards and Procedures.”

70. 40 CFR 761.207, “The Manifest--General Requirements.”

71. 40 CFR 761.340, “Polychlorinated Biphenyls (PCBS) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions,” “Applicability.”

72. 41 CFR 101-25.109-2, “Federal Property Management Regulations,” “Equipment Pools.”

73. 41 CFR 101-42, “Utilization and Disposal of Hazardous Materials and Certain Categories of Property.”

74. 41 CFR 101-43, “Utilization of Personal Property.”

75. 41 CFR 101-45, “Sale, Abandonment, or Destruction of Personal Property.”

76. 41 CFR 101-46, “Utilization and Disposal of Personal Property Pursuant to Exchange/Sale Authority.”

77. 41 CFR 101-47.103-12, “Real Property.”

78. 41 CFR 102, “Federal Management Regulation.”

79. 41 CFR 109-43, “Utilization of Personal Property.”

80. 49 CFR 172.3, “Interstate Shipments of Etiologic Agents,” “Transportation of Materials Containing Certain Etiologic Agents; Minimum Packaging Requirements.”

81. 49 CFR 171.8, “Definitions and Abbreviations.”

82. 49 CFR 172, “Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements.”

83. 49 CFR 172, Subpart D, “Marking.”

84. 49 CFR 172, Subpart E, “Labeling.”

85. 49 CFR 172.101, “Purpose and Use of Hazardous Materials Table.”

86. 49 CFR 172.202, “Description of Hazardous Material on Shipping Papers.”

87. 49 CFR 172.203, “Additional Description Requirements.”

88. 49 CFR 172.204, “Shipper’s Certification.”

89. 49 CFR 172.301, “General Marking Requirements for Non-Bulk Packaging.”

90. 49 CFR 172.304, “Marking Requirements.”

91. 49 CFR 172.310, “Radioactive Materials.”

92. 49 CFR 172.400, “General Labeling Requirements.”

93. 49 CFR 173, “Shippers - General Requirements for Shipments and Packaging.”

94. 49 CFR 173.3, “Packaging and Exceptions.”

95. 49 CFR 173.21, “Forbidden Materials and Packaging.”

96. 49 CFR 173.24, “General Requirements for Packaging and Packages.”

97. 49 CFR 173.25, “Authorized Packages and Overpacks.”

98. 49 CFR 173.54, “Forbidden Explosives.”

99. 49 CFR 173, Subpart C, “Definitions, Classification, and Packaging for Class 1.”

100. 49 CFR 173 Subpart D, “Definitions Classification, Packing Group Assignments and Exceptions for Hazardous Materials Other Than Class 1 and Class 7.”

101. 49 CFR 173 Subpart I, “Class 7 (Radioactive) Materials.”

102. 49 CFR 173.212, “State Safety Participation Regulations.”

103. 49 CFR 173.213, “Track Safety Standard.”

104. 49 CFR 173.216, “Asbestos, Blue, Brown, or White.”

105. 49 CFR 173.124, “Class 4, Division 4.1, 4.2 and 4.3,” “Definitions.”

106. 49 CFR 173.134, “Infectious Substance.”

107. 49 CFR 173.403, “Definitions.”

108. 49 CFR 173.412, “Additional Design Requirements for Type A Packages.”

109. 49 CFR 173.433, “Requirements for Determining A1 and A2 Values for Radionuclides and for the Listing of Radionuclides on Shipping Papers and Labels.”

110. 49 CFR 173.443, “Contamination Control.”

111. 49 CFR 173.474, “Quality Control for Construction of Packaging.”

112. 49 CFR 173.475, “Quality Control Requirements Prior to Each Shipment of Class 7 Radioactive Materials.”

113. 49 CFR 177.848 “Segregation of Hazardous Materials.”

## Department of Energy Documents

1. DOE Order 414.1, “Quality Assurance.”

2. DOE Order 420, “Facility Safety.”

3. DOE Order 435.1, “Radioactive Waste Management.”

4. DOE ID Order 435.A “Radioactive Waste Management.”

5. DOE Manual 435.1-1, “Radioactive Waste Management Manual.”

6. DOE Guide 441.1-13, “Sealed Radioactive Source Accountability and Control Guide.”

7. DOE Manual 474.1-1A, “Manual for Control and Accountability of Nuclear Materials.”

8. DOE Manual 474.1-2, “Nuclear Materials Management and Safeguards System Reporting and Data Submission.”

9. DOE-STD-1091-2001, “Hoisting and Rigging Manual.”

## Drawings

1. RWMC Drawing 410205, “RWMC Mark I, 6000 lb, 2′× 4′× 4 and 4′× 4′× 4 Plywood Box Assemblies.”

2. RWMC Drawing 410206, “RWMC 12, 800 lb capacity, 2′× 4′× 8 and 4′× 4′× 8 Plywood Box Assemblies.”

## Engineering Design Files

1. Engineering Design Files, EDF-2744, “Site-Specific Low-Level Waste Concentration Limits Based on Acute and Chronic Inadvertent Intruder Scenarios.”

2. Engineering Design Files, EDF-2803, “Groundwater Pathway Waste Inventory Limits for the Radioactive Waste Management Complex Performance Assessment. “

3. Engineering Design File, EDF-541, “INEEL Wooden Waste Box Capacity Upgrade.”

4. Engineering Design File, EDF INEEL-2001-032, “General Characterization for Low Level Radioactive Waste From the INEEL.”

5. Engineering Design File, WGS-005, “Free Liquid Test Method for LLW Sorbed/Immobilized Liquids.”

6. Engineering Design File, EDF-2919, “INEEL Standard Wooden Box Design Evaluation.”

## Forms

1. INEEL Form 412.11, “Document Action Request.”

2. INEEL Form 435.27, “INEEL Landfill Complex Solid Waste Log.”

3. IWTS Material and Waste Characterization Profile.

4. INEEL Form 435.39 “Waste Determination and Disposition Form.”

5. IWTS Shipment and Relocation Profile.

6. INEEL Form 435.2, “No Radioactivity Added Certification.”

7. INEEL Form 435.35, “Refrigeration/Air Conditioning Appliance Disposal Certification.”

8. INEEL Form 450.17, “Materials Exchange.”

9. INEEL Form 450.18, “Material Change of Custody.”

10. INEEL Form 473.73, “Checklist for Unclassified/Sensitive Information Recycle/Destroy.”

11. INEEL Form 573.06, “Recycled Toner Cartridge.”

12. Certified Waste Data Base System Transuranic Waste Data Base Input Form.

13. Environmental Protection Agency Form 8700-22, “Uniform Hazardous Waste Manifest.”

## Manuals

1. *INEEL Radiological Control Manual, BBWI Manual* 15A.

2. DOE Standard Hoisting and Rigging, DOE-STD-1090-2001.

## Miscellaneous Documents

1. Idaho Administrative Procedures Act (IDAPA) 58.01.11, “The Idaho Water Quality Standards and Water Treatment Requirements.”

2. Idaho Operations Property Management Instructions (IDPMI).

3. Toxic Substances Control Act (TSCA)

4. DOE-ID-10333, Pollution Prevention Plan, U.S. Department of Energy Idaho Falls, ID.

5. DOE-ID-10399, INEEL Radiological Control Manual

6. MCP-62, “WGS Low-Level Waste Management.”

7. MCP-63, “WGS Conditional Industrial Waste Management.”

8. MCP-69, “WGS Hazardous Waste Management.”

9. MCP-70, “WGS Mixed Low-Level Waste Management.”

10. MCP-2465, “Records of INEEL/Government Property.”

11. MCP-2466, “Control of INEEL/Government Property.”

12. MCP-2468, “Management of Precious Metals.”

13. MCP-2478, “Disposing of Non-Proliferation Sensitive Government Personal Property.”

14. MCP-3469, “RCRA Satellite Accumulation Areas.”

15. MCP-3470, “RCRA 90-day Storage Areas.”

16. MCP-3471, “Temporary Storage of PCB Waste.”

17. MCP-3480, “Environmental Instructions for Facilities, Processes, Materials and Equipment.”

18. MCP-3689, “Material Exchange Program.”

19. MCP-3775, “Acquisition, Control and Use of Hazardous Material Packaging.”

20. MCP-9374, “Management of Universal Waste.”

21. PDD-1003, “Waste Generator Services Program.”

22. PLN-1036, “Waste Incidental to Reprocessing Determination Activities.”

23. PRD-166, “INTEC PEW Chemical and Tank Farm Acceptance Criteria.”

24. PRD-310, “INEEL Transportation Safety Document.”

25. PRD-5030, “Environmental Requirements for Facilities, Processes Materials, and Equipment.”

## Miscellaneous Federal Government Documents

1. Environmental Protection Agency (EPA), “Test Methods for Evaluation of Solid Waste, Physical/Chemical Methods,” SW-846.

2. EPA/625/7-88/003, “Waste Minimization Opportunity Assessment Manual.”

3. Federal Property Management Regulation 101-42.

4. TRUPACT-II Authorized Methods for Payload Control (TRAMPAC).

5. Safety Analysis Report for the RH-TRU 72-B Waste Shipping Package, August 1999.

## Permits

1. RCRA Part A, “HWMA/RCRA PART A PERMIT APPLICATION THE INEEL VOLUME 1 BECHTEL BWXT IDAHO, LLC.”

2. INEEL Landfill Complex, “Idaho DEQ Air Quality Permit.”

3. RCRA Permit, “Applicable RCRA Permit or Part B Permit Application.”

    a. Part B Permit Application, “Available from BBWI Environmental Affairs Organization.”

    b. Waste Reduction Operations Complex RCRA Permit, “HWMA-RCRA STORAGE AND TREATMENT PERMIT WERF-WROC ON THE INEEL EPA ID NO. ID4890008952.”

c. Radioactive Waste Management Complex RCRA Permit, "FINAL HWMA STORAGE PERMIT FOR THE RADIOACTIVE WASTE MANAGEMENT COMPLEX ON THE INEEL - EPA ID # ID4890008952."

d. Other RCRA Permits for facilities addressed in the INEEL WAC will be available on the BBWI Document Management Control System when issued.

## Safety Analysis Reports

1. Radioactive Waste Management Complex, Safety Analysis Report (RWMC SAR).

2. Radioactive Mixed Waste Staging Facility, Safety Analysis Report (CPP-1617 SAR).

## Specifications

1. ES-50338 Rev. E, July 5, 1994. Liner, plastic, radioactive waste, 4 ft × 4 ft × 4 ft container VWP-572027; ES-50339, Rev. E, July 5, 1994. Liner, plastic, radioactive waste, 4 ft × 4 ft × 8 ft container VWP-572026; or ES-50340 Rev. E, Liner, July 5, 1994. Plastic, radioactive waste, 2 ft × 4 ft × 8 ft container VWP-572028.

2. ES-51470 current revision, "Specification for Container, Radioactive Waste, Wood."

3. SPC-1512 2×4×8 and 4×4×8; 12,800 lb Radioactive Waste Wood Containers January 9, 2002.

## Standards

1. ANSI/ANS, 1981, "Nuclear Criticality of Special Actinide Elements," ANSI/ANS, American National Standards Institute/American Nuclear Society 8.15-1981.

2. ASME, 1989, "Quality Assurance Program Requirements for Nuclear Facilities," ASME-NQA-1-1989 edition, The American Society of Mechanical Engineers, New York, NY.

3. ASTM, 1982, "Evaluation of Fire-Retardant Paints for Use at the INEEL," ASTM, American Society for Testing and Materials, E-84, WM-F1-22-005, 1982.

4. ASTM Designation E 181-93, "Standard General Methods for Detector Calibration and Analysis of Radionuclides."

5. ASTM Designation C 1000-90, "Standard Test Method for Radiochemical Determination of Uranium Isotopes in Soil by Alpha Spectrometry."

6. ASTM Designation C 1001-90, "Standard Test Method for Radiochemical Determination of Plutonium in Soil by Alpha Spectrometry."

7. ASTM Designation C 1205-91, "Standard Test Method for the Radiochemical Determination of Americium-241 in Soil by Alpha Spectrometry."

8. ANSI N42.14-1991, "American National Standard Calibration and Use of Germanium Spectrometers for the Measurement of Gamma-Ray Emission Rates of Radionuclides."